

# COMPUTER

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## Maintains 'Bypass' Schemes feasible for Many Users

By Phil Hirsch

CW Washington Bureau

PARAMUS, N.J. — Despite all the talk about using microwave and cable TV channels to bypass telephone company local exchange networks, bypass solutions are unlikely to be feasible for many data communications users, maintains a study by Perspective Telecommunications Group, a consulting firm headquartered here.

One reason is that telephone-company-provided local loops are virtually ubiquitous, while the alternatives are not. In addition, "many of the prospective providers of [bypass] solutions are not themselves equipped to provide the kind of support users have been receiving from the [telephone companies]," according to the study.

### Westinghouse Set to Transmit Via Cable TV

WASHINGTON, D.C. — Westinghouse Electric Corp. will use cable TV channels to transmit voice and data among three of its locations in downtown Pittsburgh, Pa., the company said last week.

The Westinghouse channels will go into regular service within the next two months, according to Tom Rush, vice-president of Warner-Ames Cable Communications, Inc., which will supply the transmission facilities. Warner-Ames is negotiating similar arrangements with several other large corporations in Pittsburgh and other cities, and "we hope to sign up three or four more customers within the next six months," he said.

Westinghouse's decision to use cable TV comes at a time when most of the nation's biggest tele-

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Moreover, bypass users — likely to be those users that need higher data rates than the telephone company can provide, have multiple locations within an urban area and employ more than about 100 people — will "have to help vendors provide a solution," a commitment that Perspective Telecommunications said many users will be unwilling to make.

The key point of the study is that although a number of bypass vendors will exist and although the potential market for their services will amount to about \$2.3 billion annually, local telephone companies will continue to be the dominant providers of local exchange services, which Perspective Telecommunications dubbed intracity communications networks.

In 1982, out of total intracity communications network revenues of \$18.5 billion, telephone companies garnered \$16.9 billion; CATV operators pocketed most of the rest, according to the study. By 1985, the total intracity network

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## Users to Pay More To Local Phone Firms

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Telecommunications users will pay their local telephone companies more beginning Jan. 1 to handle Message Toll Service and Wats calls. That is the main thrust of an access charge reimbursement plan released here last week by the Federal Communications Commission.

Access charges are now collected from interstate carriers, who pass them on to their customers. Under the new scheme, end users will be billed directly for some of those charges.

The new plan was adopted by the commission last December, but the order describing how it will work — comprising 105 pages plus numerous exhibits — was not released until last week. Here are the main points of the FCC order:

- Charges will be shifted gradually over a seven-year period beginning in 1984. Part of the resulting increase in local rates will consist of a flat monthly charge per line, while the rest will be billed on the basis of usage.

- Local telephone companies will be allowed largely on their own to decide how much they wish to collect through flat charges and how much through usage-based fees. However, the commission has established certain limits: The flat charge must be at least \$2/mo for residential users and \$4/mo for business users. Moreover, the charge for business users cannot be more than two times larger than the charge for residential

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## Competition Forces Change

The access charge reimbursement scheme had to be changed because the telecommunications industry is becoming more competitive. Since access charges represent a significant percentage of what the end user pays for service and the telephone carriers now determine, largely on their own, what those charges will be, the present system will not work in a market where multiple vendors are competing directly against many of those carriers.

As Federal Communications Commissioner James Quello put it in a statement appended to the commission's order:

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## System Test Site Wins Settlement Of \$1 Million

By Jim Bartleson  
and Susan Blakeney

CW Staff

PITTSBURGH, Pa. — The Steel City has won roughly \$1 million in an out-of-court settlement from Coopers & Lybrand, Inc. and Software International Corp. in a battle over what City Solicitor Dante Pellegrini called bad advice and unusable software. The settlement came after four months of negotiations but before the city filed a lawsuit.

The city controller's office decided in 1980 to upgrade its accounting and financial systems. It had been using an NCR Corp. system that could no longer handle all its various accounts. The city hired Coopers & Lybrand, one of the "Big Eight" accounting and consulting firms, to come up with a solution.

Coopers & Lybrand recommended a software package called Fiscal Control/80, which it had developed jointly with Software International of Andover, Mass. The consulting firm also recommended that Software International provide the needed hardware to the city.

The system put together by Software International was comprised of the Fiscal Control/80 software and a Hewlett-Packard Co. HP 300 computer. It was installed in City Controller Jim McGrady's office in January 1982. By the middle of the first quarter, it became obvious that there were "serious problems" with the system, according to Pellegrini. At

(Continued on Page 8)

## DG Unwraps Supermini to Rival 4341-12

By Ed Scannell

CW Staff

NEW YORK — Data General Corp. demonstrated a commitment to both its commercial and scientific users here last week by unwrapping a high-end 32-bit system it claims is 60% faster than IBM's 4341 Model Group 12 at one-third the cost.

The Eclipse MV/10000 is DG's most powerful supermini to date and will be targeted at both the office automation and industrial automation markets. Software-compatible with all of DG's 32-bit and 16-bit minicomputer lines and offering support for up to 192 terminals, it will be marketed as a mainframe replacement.

The virtual memory machine reportedly scores a single-precision Whetstone rating of 2,500, according to DG estimates. This is said to com-

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Data General's Eclipse MV/10000 supermini introduced last week is compatible with the vendor's existing 16-bit and 32-bit systems.



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Speaking of names, maybe we ought to change ours to the "Bureau of Missing Software Programs"

Last year, for example, we brought you the first high-performance sort program for VM, the fastest growing operating system. SyncSort CMS became an overnight success. It didn't use many resources - machine or human - and it was a pleasure to use. Today it has over 350 users.

Now we've broken through another VM barrier. SYBACK is the first advanced-design, flexible Backup, Restore, and Copying program for VM. It too uses minimal resources, and it renders all other VM Backups obsolete as of today!

**THE BAD OLD DAYS:** Most of the VM Backups now in use are low-level programs, to put it charitably (Subterranean might be a better word.) They simply use too many machine resources. And they require too much manual assistance from the operations staff.

As a result, much of the Backup, Recovery and Copying done in the nation's VM centers is just plain lousy. It's often done haphazardly...sporadically...or not at all. Heaven only knows how much this has cost in terms of destroyed data, incomplete records, and damaged reputations.

**GOODBYE TO MICKEY MOUSE:** SYBACK changes all that. Here's what it can do for you in the three areas that really matter:

**(1) PERFORMANCE.** As a result of new and unique access methods, SYBACK uses far fewer computer resources than any other VM Backup. Compared to IBM's DDS, it will save you:

- 50% in Elapsed Time;
- 30% in CPU Time;
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**(2) CAPABILITIES.** SYBACK is unique in the range and sophistication of its features. Things like:

- Automatic backup based on CP directory;
- Stand-alone restore capability;
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- Catalog of backup operations;
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- DASD to DASD conversion or copying.

**(3) SERVICE.** We're well and favorably known for providing fast, helpful service. More than 85% of all customer inquiries are resolved within 24 hours.

If you'd like to reduce the human and machine resources that go into VM Backup and Copying, give us a call. We'll introduce you to our tight-fisted SYBACK. It's a real chip off the old MacSyncsort block!

## Model 204 DBMS Put Under CMS, VSE)

By Paul Gillin  
CW Staff

CAMBRIDGE, Mass. — Computer Corp. of America (CCA) last week extended its Model 204 database management system (DBMS) to IBM VM/CMS, DOS/VS and DOS/VSE operating system environments. The package had previously been available only to users running OS/MVS.

At the same time, the company announced full-screen editing and enhanced recovery capabilities, as well as an optional document-handling feature.

With this release of Model 204, DOS/VS and VSE users can write on-line applications without adding a teleprocessing monitor, a CCA spokesman said. Telecommunications access is supported via Bnam for IBM 3270 terminals. Vnam support will be available in the third quarter, the spokesman added.

By providing a direct interface to Bnam, Model 204 eliminates the need for a teleprocessing systems programmer, according to Larry DeBoever, CCA director of marketing.

The CMS version of Model 204 runs in native mode with no loss of performance, the spokesman said. The DBMS performs its own I/O and can be installed without modifications to CMS or VM.

The multiuser version of the DBMS reportedly allows large numbers of users to access concurrently and update data bases, under the control of a Model 204 virtual machine without significant performance degradation. The virtual machines

communicate with users via an interface to the Virtual Machine Communications Facility (VMCF), the spokesman said.

The VMCF interface can provide access from CMS to a copy of Model 204 residing on a guest operating system, DeBoever said.

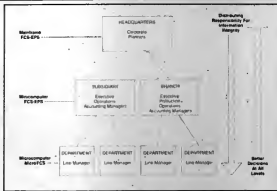
The full-screen editing enhancement announced last week for the Model 204 DBMS is an IBM Xedit-like feature that allows users to view User Language procedures a screenful at a time and to make alterations using a cursor, CCA said. The transaction back-out capability allows the effects of an incomplete data base update to be reversed by undoing updates or incomplete transactions.

The Text/204 option is an on-line document storage and retrieval system that integrates textual data into the data base. Designed to compete with Infodata Systems, Inc.'s Inquire and IBM's Storage and Information Retrieval System, the option provides a full-screen user interface with menu, prompts and on-line help, CCA said.

The DOS/VS and VSE version of Model 204 is available immediately for \$155,000. The CMS version, available in June, is priced at \$195,000. The price of the DBMS includes a one-week, on-site training course for Model 204 and User Language.

Full-screen editing and transaction back-out is free to current customers. Text/204 costs an additional \$30,000.

CCA is located at Four Cambridge Center, Cambridge, Mass. 02142.



Components of FCS-EPS for Distributed Decision Support

## DSS for IBM Sites Runs On Micro to Mainframe

By Lois Paul  
CW Staff

WINDHAM, N.H. — EPS, Inc. has announced a distributed decision support system (DSS) that runs on IBM systems from micros through mainframes. The software is composed of FCS-EPS, its DSS package for minis and mainframes, and its recently unveiled MicroFCS for microcomputers [CW, Jan. 10].

The distributed DSS, called FCS-EPS for Distributed Decision Support, provides a standardized decision support language, common information at all levels, mainframe modeling and analysis power on the micro and controlled additional use of existing corporate information, according to the vendor.

"In most organizations today, any decision support analysis is done at headquarters on the company mainframe. In the budgeting process, budgets are created and mailed in the old brown envelope to all involved. It's a one-way process — top down," said Robert J. Earle, president of EPS. "If people have computers at lower level operating entities today, you can just about guarantee they don't share information for decision support purposes. Through Distributed DSS, they will."

According to Earle, MicroFCS was the final component needed to enable companies to standardize their DSS models and forecasts to distribute DSS throughout the organization. MicroFCS, which allows simple row and column spreadsheet processing and multifunctional mainframe-style analysis, includes packaged applications driven from function keys and menu-driven operations, EPS noted.

All of EPS' DSS software reportedly operates with exactly the same syntax and procedures. Therefore, it is possible in the IBM environment to upload and download logic and data.

Corporate planners on the mainframe can run, check and analyze models developed on the IBM Personal Computer, and Personal Computer users can use parts of corporate models which pertain to them for detailed analysis of their own business responsibility, an EPS spokesman pointed out.

In addition, users can hook into

external files for government statistics, Dow-Jones information or other data bases and include this information in models at any level of hardware use, according to the vendor.

FCS-EPS for Distributed Decision Support also is said to enable users to share a common data base if the machines on which they are running the software were designed for multiple users. For the Personal Computer, which is not a multiuser system, one can pass data back and forth and it is accessible through normal communications links.

FCS-EPS, the DSS for mainframes and minis, is available on IBM computers from the Personal Computer through the IBM 4380 and 30 series mainframes. It is also said to run on equipment from Hewlett-Packard Co.; Wang Laboratories, Inc.; Honeywell, Inc.; Sperry Univac; Digital Equipment Corp.; and others.

The mainframe version of FCS-EPS is priced from \$48,000 to \$140,000, depending on configuration. The microcomputer version of FCS-EPS is available for between \$25,000 and \$60,000, also depending on configuration.

MicroFCS is available for \$300 up, depending on configuration and volume purchased.

The cost for FCS-EPS for Distributed Decision Support is configuration-based and depends on the price of its components, the vendor spokesman said.

For cost information can be obtained from EPS, Inc. at One Industrial Drive, Windham, N.H. 03087.

## Corrections

In "Users Fighting to Contain Costs" [CW, Feb. 21], it was incorrectly stated that Global Marine, Inc. of Houston has reduced software maintenance costs to 60% of its software budget. Maintenance costs were actually reduced to 40% while new development increased to 60%.

The Wordstar diskette mentioned in Werner L. Frank's "Fake Apples in Hong Kong: Rotten to the Core" [CW, Feb. 28] is from Micropro International Corp., not Xerox Corp., and the Z80 Softcard is from Microsoft, Inc., not Zilog, Inc.

## 'Maxicalc' Spreadsheet Out for IBM Mainframes

By Lois Paul  
CW Staff

HASBROUCK HEIGHTS, N.J. — An on-line electronic spreadsheet package for IBM and plug-compatible mainframes, running under OS and DOS with CICS was announced last week by Oxford Software Corp.

Oxford's Maxicalc is an interactive nonprocedural electronic spreadsheet software package that reportedly executes as a CICS application. It is menu driven and is said to require no data processing experience to operate. The software basically enables IBM 3270 terminals connected to a mainframe via CICS to handle electronic spreadsheets organized by rows and columns.

Maxicalc does not require any modification to CICS or the IBM operating system, Oxford said. It includes a 512-row by 64-col. spreadsheet capability, program function (PF) key support, a range of arithmetic operations, formula calculation capabilities, scrolling functions and split-screen viewing and direct row/column positioning.

In addition, the software features hard-copy reporting capabilities and built-in spreadsheet security.

The functions of Maxicalc are made available through four menu screens that are presented as options

in the main menu. These are Maxicalc Worksheet, Report Screen, Maintenance Screen and Options Screen, Oxford said.

The worksheet is the main system screen where the user enters information into a grid of coordinates. The information will be calculated to a total of 15 significant digits and will be displayed based on the specified width of the field, the vendor explained.

The Report Screen enables users to specify which work sheet is to be printed on what printer. The file Maintenance Screen is the connection between the work sheet being viewed and data storage where work sheets are kept between terminal sessions. Vnam files are used, the vendor noted.

The Options Screen displays the PF key assignments used by Maxicalc, as well as the corresponding mnemonics.

Maxicalc runs on IBM 370, 4300 series, 30 series and plug-compatible mainframes. It supports CICS/VS Release 1.5 and up and the IBM Vnam access method.

The software is priced at \$12,000 for the DOS version and \$15,000 for the OS version. Oxford Software is located at 174 Blvd., Hasbrouck Heights, N.J. 07604.

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## WORKSHOP (5 Days)

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May 9-13 Oklahoma City

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May 16-20 Washington, DC

May 16-20 San Francisco  
May 23-27 Milwaukee

May 23-27 Birmingham, England  
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June 6-10 Regina  
June 6-10 Phoenix

June 13-17 Copenhagen  
June 13-17 London

June 13-17 Portland  
June 20-24 Los Angeles

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May 2-6 Toronto

May 9-13 Atlanta  
May 9-13 Seattle

May 16-20 Boston  
May 16-20 Edmonton

June 6-10 Washington, DC  
June 6-10 Winnipeg

June 13-17 Cleveland  
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June 13-17 Salt Lake City  
June 20-24 London

June 20-24 New York

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June 20-21 Boston

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May 16-20 San Francisco

May 23-27 London  
June 13-17 Washington, DC

June 20-24 Chicago  
June 20-24 Houston

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May 11-12 Chicago  
May 16-17 Toronto

June 6-7 Anaheim  
June 13-14 Boston

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April 25-27 London

April 25-27 San Francisco  
May 2-4 Toronto

May 9-11 Anaheim  
May 16-18 Washington, DC

June 6-8 Chicago  
June 13-15 Houston

June 20-22 Boston  
FINANCIAL MODELING—A STRUCTURED APPROACH (5 Days)

April 11-15 Washington, DC  
May 16-20 New York

June 20-24 Cleveland  
STRUCTURED DESIGN & PROGRAMMING WORKSHOP FOR MICROPROCESSORS (5 Days)

April 4-8 Boston  
May 16-20 San Jose

May 16-20 Anaheim  
MGT. IMPLICATIONS OF STRUCTURED TECHNIQUES FOR MICROPROCESSORS (2 Days)

April 4-5 Anaheim  
ADA SOFTWARE ENGINEERING WORKSHOP (5 Days)

April 4-8 San Jose  
April 11-15 Washington, DC

June 20-24 San Jose  
June 27-31 Washington, DC

## STRUCTURED ANALYSIS & SYSTEM SPECIFICATION WORKSHOP FOR MICROPROCESSORS (5 Days)

May 2-6 Anaheim  
June 6-10 Boston

## STRUCTURED SYSTEMS DEVELOPMENT (1 Day)

April 11 Atlanta  
April 22 Washington

May 16 Boston  
May 23 Kansas City, MO

June 13 Toronto  
June 20 New York

## STRUCTURED DESIGN & PROGRAMMING WORKSHOP (5 Days)

April 4-8 Chicago  
April 18-22 Amsterdam

April 18-22 New York  
May 9-13 London

May 16-20 San Francisco  
May 23-27 Boston

June 6-10 Washington, DC  
June 13-17 Denver

June 13-17 Toronto  
STRUCTURED PROGRAMMING WORKSHOP (5 Days)

April 4-8 Houston  
April 18-22 Toronto

May 2-6 San Francisco  
May 23-27 Boston

June 6-10 New York  
June 20-24 Anaheim

## STRUCTURED PROGRAMMING IN COBOL (2 Days)

April 13-14 Washington, DC  
June 20-21 San Francisco

## STRUCTURED ANALYSIS & DESIGN WORKSHOP (5 Days)

April 4-8 New York  
April 4-8 Minneapolis

April 11-15 Calgary  
April 18-22 Ottawa

April 25-29 Denver  
April 25-29 Washington, DC

May 2-6 Boston  
May 2-6 Atlanta

May 9-13 Chicago  
May 9-13 Toronto

May 16-20 Copenhagen  
May 18-20 London

May 16-20 San Antonio  
May 23-27 San Francisco

June 6-10 Houston  
June 13-17 Indianapolis

June 20-24 New York  
June 20-24 Portland

June 20-24 Regina  
June 27-31 Anaheim

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# YORDUN

# 'Pennet' Connects PE Series 3200 Superminis

By Lois Paul

CW Staff  
OCEANPORT, N.J. — Perkin-Elmer Corp. is scheduled to announce today networking software to interconnect its Series 3200 superminis for data and resource sharing.

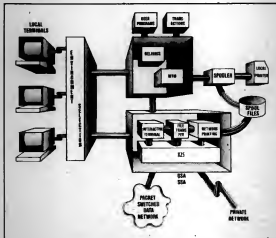
The Pennet software enables the 32-bit machines in dispersed or clustered configurations to communicate with each other over private lines or via packet-switched networks. This allows a user to tailor its DP resources to meet its daily requirements, extra computing power that is needed only occasionally can be pulled from the network when needed, the vendor explained. Resources at different sites, therefore, can be shared instead of duplicated.

Pennet is based on the CCITT X.25 standard for computer-to-computer communications through packet-switched data networks such as GTE Telenet Communications Corp.'s Telenet in the U.S., the UK's Packet Switching Service and West Germany's Datex-P.

## Expansion Plans

In the near future, the software will be expanded to support IBM's Systems Network Architecture and the Ethernet standard interface for local-area networks, according to Michael R. Winters, PE senior marketing manager.

Pennet is planned to complement other PE communications products



Pennet Architecture

that include IBM 2780/3780 remote job entry facility, a Hsp emulator for file transfer between PE machines and IBM computers or between two PE machines, and an emulator for IBM 3270 Binary Synchronous Communications which enables applications using PE data buses to access a remote IBM data base.

Pennet's Interactive Terminal Fa-

cility reportedly allows terminals attached to one PE system to log on to PE's Reliance transaction processing or Multi-Terminal Monitor (MTM) time-sharing environments in a second PE system and have the same capabilities as if they were directly attached to the system. Messages to and from several terminals would then be concentrated in the local

computer and multiplexed over a single synchronous communications link in the network, eliminating the need for long-distance communications links between geographically dispersed terminals and computers, the vendor noted.

Pennet's File Transfer Facility is said to allow files of any length to be transferred from one system in the network to another system on the network. For example, users could perform data collection in remote systems and transfer files for processing when needed.

A Network Printing Facility allows programs running under the PE OS/32 operating system, MTM or transaction processing environment to output data such as reports, memos and operating data to printers connected to other PE superminis in a network. Pennet's Network Control Facility maintains a log of significant events that occur during network operation and allows communications lines to be removed from the network for maintenance or error analysis.

## With Multilevel Security

Pennet includes multilevel security that is controlled by the target environment, as well as facilities to control access to the network on a terminal-by-terminal basis, according to Winters.

Pennet runs on the full range of PE superminis, including Model 3210, Model 3230 and Model 3250. An initial Pennet package is available for \$7,000, copies cost \$1,725 each. This fee includes initial service maintenance, which is comprised of a 90-day warranty for the software and all adjustments to the software for nine months after purchase.

Optional maintenance agreements after the first year include the software service agreement and extended software maintenance. The former is available for \$200/mo and includes provisions under which PE personnel go to user sites to install any Pennet enhancements. The latter, available for \$400/year, provides users with documentation of any changes to the product.

The Pennet software is available immediately from PE 2 Crosscut Place, Oceanport, N.J. 07757.

# Study Says Bypass Solutions Unfeasible

(Continued from Page 1)

market should be worth \$28 billion, Perspective Telecommunications said, adding that the telephone companies will get all but about \$2.3 billion.

## Restricted Support

In addition to relatively limited coverage and the need for extra help from customers, bypass technologies generally are handicapped by limited bandwidth and/or range. That means the number of applications they can cost-effectively support is restricted, the study noted.

The study also maintains that if a user's local telephone company can provide high-speed data transmission equivalent in quality and price to that offered by a bypass provider, the user will do business with it rather than with a bypass provider.

The key questions, therefore, are whether the local telephone companies' rates will remain competitive and how quickly they will upgrade their existing networks.

On the first point, "it can be very reliably predicted that for at least the next five years the cost of local circuits will rise," the study said largely because of the higher access charges recently mandated by the Federal Communications Commission. Perspective Telecommunications contended that business, rather than residential users, will pay the bulk of the increase.

On the second point, the study noted that the telephone companies have already begun adding digital capability to their networks, but "it will be some years before the effect

of this activity is felt by the marketplace." However, it is unclear whether user demand will overload the widespread facilities that local telephone companies make available in the meantime.

The appeal of the telephone companies will also depend partly on how quickly competing CATV facilities become available. According to the study, "CATV demonstrates the greatest potential as an alternative to [telephone company] local circuits. They overcome the limited bandwidth and limited range of other bypass technologies."

Two-way CATV systems dedicated to business and institutional users,

"are now being installed in the business districts of many cities," the study pointed out. In addition, "hardware is available today to address the large user's requirements," and while "CATV operators are not familiar with the commercial market" or with the specific needs of data communications users, the association of CATV companies with voice/data transmission firms represents a possible solution to this problem.

The current collaboration of MCI Communications Corp. and Coa-Cable Corp., for example, "is likely to produce some very effective solutions for large customers."

# Westinghouse to Transmit via Cable TV

(Continued from Page 1)

communications users are looking for alternatives to telephone-company-provided local circuits because of the higher charges expected because of the breakup of the Bell system next year. Meanwhile, CATV operators and other "bypass" vendors are trying to establish their credibility.

"We chose cable TV mainly to reduce the chance of service interruptions," explained Westinghouse Communications Manager Bob Bennis. Microwave transmission is risky in downtown Pittsburgh, he said, because construction of a new building can force rerouting of the transmission path.

Asked about the relative cost of cable TV, Bennis said comparisons are hard to make because "we're leasing from Warner-Ames; whereas, we

would have purchased microwave facilities."

## Comparing Costs

Comparing the cost of the Warner-Ames channels to equivalent offerings from the phone company is also difficult, he added, because T-1 circuits capable of operating at 1.544M bit/sec are not available locally from Pennsylvania Telephone Co.

Westinghouse will lease three 1.544M bit/sec cable TV channels from Warner-Ames. They will form part of the Westinghouse Digital Information Network (Wesdin), a microwave-based private system interconnecting company locations throughout the Greater Pittsburgh area. The network, now about 60% complete, currently serves about 9,000 terminals, Bennis said.

The three CATV channels will link a Wesdin hub office with two end offices about three-quarters of a mile away, explained Wesdin Manager Bill Hunkle. At each end, each channel will be a T-1 interface connected to a digital private branch exchange. Each of the CATV channels is subdivisible into 24 digital voice channels.

Initially, about 90% of the capacity will be reserved for voice, the rest for data transmission at speeds up to 56K bit/sec, Hunkle said.

Warner-Ames is now building a two-way, three-trunk cable TV system in Pittsburgh. One trunk, serving the downtown area, is made up of outlying commercial areas, will be dedicated to business and institutional users and will supply the channels leased to Westinghouse.

## DG Unveils 4341-12 Rival

(Continued from Page 1)

pire with ratings of 1,100 for IBM's 4341-12 processor and 1,200 for Digital Equipment Corp's VAX-11/780 supermini-computer.

The company attributes the system's speed to a dedicated address generator that operates with a two-board Floating Point Unit and three system caches. The dedicated address generator, which DG claims is the first such device to be incorporated in a category of machine like the MV/10000, speeds processing capability by creating logical addresses from the instruction stream.

The three system caches include a 16M-byte mapped memory cache, a 4K-byte instruction cache to speed up instruction fetching and a 1024-entry address translation cache that is said to accelerate the logical-to-physical translation process.

Other features aimed at increasing overall system speed include a dual-ported memory system capable of transferring 57.2M byte/sec of data and two I/O controllers that provide users with a range of bandwidths large enough to accommodate varying applications and peripheral performance characteristics.

While the system offers an extended upgrade path for current DG computer users, it is also billed as a mainframe replacement. According to DG Information Systems Division Vice-President David Lyons, many large organizations have been unable to implement large-scale commercial applications because of what he claims is the high cost of mainframes and the lack of quality software.

The MV/10000 system will reportedly support 100 workstations at a cost of \$7,500 per station.

The basic version of the MV/10000, which comes with 2M bytes of main memory, a 16M-byte disk, a dual-mode tape drive, a 16-line intelligent asynchronous controller, a Dasher T12 printer with keyboard,

the firm's AOS/V5 operating system license and cabinet, costs \$211,000.

A 100-workstation office system with 8M bytes of memory, two disk subsystems, two dual-mode magnetic tape subsystems, seven asynchronous controllers, one intelligent synchronous controller, the Xodiac Network Management System, LDP laser printer, 10 letter-quality printers, 100 Dasher workstations, AOS/V5 operating system, Comprehensive Electronic Office software and Cobol language costs \$666,270.

The system, graphics workstation and terminal are expected to be available in 90 days.

Information about the MV/10000, graphics terminals and workstations is available from DG, 4400 Computer Drive, Westboro, Mass. 01580

## DG Announces CAE Products

NEW YORK — In addition to introducing its high-end MV/10000 supermini here last week, Data General Corp. also announced a series of computer-aided engineering (CAE) hardware products, a first for the firm in this area.

The CAE products include:

- The GW/4000 Expert Workstation, a high-resolution color graphics system based around the company's MV/4000 processor. A typically configured system is priced at \$68,300.

- The Dasher G500 color graphics terminal, capable of displaying bit-mapped, medium-resolution graphics for business applications. This unit is priced \$9,500, accord-

ing to the vendor.

- The GDC/1000 Graphics Display Controller, an OEM-oriented two-board version of the GW/4000 workstation. The 768-pixel by 1024-pixel version of the product lists for \$21,900.

The MV/10000 general-purpose computer system introduced last week can also be used for industrial automation applications — chief among them CAE, noted Don McDougall, director of the company's Technical Products Business Unit. Examples of CAE applications include mechanical engineering, electronic and electrical engineering and architectural engineering and construction, McDougall added.

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## Cullinet Gets New President

WESTWOOD, Mass. — Robert N. Goldman last week was named president and chief operating officer of Cullinet Software, Inc. (formerly Cullinane Database Systems, Inc.), succeeding John Cullinane.

Cullinane will remain as chairman and chief executive officer of the company he founded. He said his future activities will be devoted to long-range planning and corporate development.

Goldman, 33, has been executive vice-president of Cullinet for more than a year. Previously, he was responsible for technical development of the company's Integrated Database Management System (IDMS), vice-president of software development and senior vice-president of product development. He was with AT&T before joining Cullinane in 1973.

Frank L. Chisholm has been named executive vice-president succeeding Goldman. Chisholm, 34, has been senior vice-president since 1980, responsible for sales of the company's integrated software systems.

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## Other Keyboards Proposed Over the Years

By Patricia Keefe  
CW Staff

Despite the longevity of what is called the Qwerty keyboard, several alternate designs have been proposed over the years in addition to the Dvorak model, which was accepted with a few changes by the American National Standards Institute last week.

The primary complaint about the Qwerty keyboard, named after its first six letters, is that the keys were

arranged to slow down deliberately typists and prevent early manual typewriters from jamming. However, a study conducted in 1949 and published in the *Journal of Franklin Institute* outlined five major areas where keyboard improvements could upgrade operator performance:

- One-handed motions consumed, on the average, 75% more time than two-handed motions, which tend to be easier and faster.

- The Qwerty keyboard required users to reach from the home, or middle row, where the fingers rest, for 88% of all key strokes. The study suggested putting 70% or more of the strokes in the home row.

- The hardest motions were found to be one-handed motions with reaches to one or two rows above the home row.

- The Qwerty keyboard was found to overlook the left hand with 56% of the total strokes.

- The Qwerty keyboard resulted in many awkward one-handed fingerings and the load on each finger was not equally distributed.

One keyboard design that attempts to address these problems is the Dvorak method, introduced 50 years ago. Study results have been limited and so far do not prove Dvorak's superiority over Qwerty.

Another alternative is the Alphabet Layout, which might be preferable for nontypists required to input alphabetic data, according to Robert W. Bailey's *Human Performance Engineering: A Guide for System Designers*. But at least two studies have failed to show an advantage in this situation.

In 1926, a German named Klockenberg published his ideas on typewriter design, which essentially entailed dividing the keyboard into separate sections for the left and right hand.

And PCD Maltron, Ltd. received a U.S. patent in January 1981 for its split keyboard, which places the special function keys, numbers and the "E" and space keys in the middle of a curved keyboard. Maltron maintains the Qwerty design imposes a great deal of physical stress on the operator and claims their board is designed to minimize that stress.

## Pittsburgh Wins \$1 Million Settlement

(Continued from Page 1)

one point, he said in a recent interview, there were 47 different flaws in the program.

By April, the situation had become so serious that the city controller's office was offloading its financial and accounting processing to Pittsburgh's DP function, known as City Information Systems, and utilizing an outside service bureau. City employees were asked to work 14-hour days to keep city records up to date, the *Pittsburgh Press* reported.

Touche Ross Co., another "Big Eight" accounting firm, has replaced Coopers & Lybrand. It is working on a temporary solution for the controller's office and conducting a new requirements study.

The \$1 million award is made up of \$530,000 that Pittsburgh had paid to Coopers & Lybrand, \$230,000 to reimburse the city for implementation losses and \$76,000 to reimburse the city for the time it operated the system. The remaining money represents a forgiving of debts by Software International and Coopers & Lybrand and a year's use of the hardware at no cost to the city.

Asked last October what Software International's responsibility was to the City of Pittsburgh, Tim Cronin of the vendor's legal department said that the city was acting as a beta test site for Fiscal Control/80 and that its license for the software did not carry a warranty. Moreover, he main-

tained, Software International had offered to revise the program to address all of the city's complaints, but the city refused to let it.

Since the settlement, however, Joseph Powers, product manager of Software International, commented, "The settlement appears to be a fair and equitable one all the way around. We're glad it's settled."

A spokesman for Coopers & Lybrand last week said "no comment" when asked for the company's reaction to the settlement. Last October, however, another Coopers & Lybrand spokesman denied any "conflict of interest" charges in connection with its recommendation of the Software International package and maintained that the software could "surely" have been made operational "given enough time and effort."

Pellegrini feels "pretty good" about the settlement, but also believes "we are back to square one."

Pellegrini added that the case has taught him several painful lessons. "When you pick consultants," he advised, "check out the software they recommend to make sure it works. Also, realizing it isn't a perfect world, pick a consulting company that has the financial resources to back it mistakes."

## Massachusetts Town Also Gets Its Money Back

BROOKLINE, Mass. — While Pittsburgh can feel satisfied about its hefty cash settlement with Coopers & Lybrand, Inc. and Software International Corp., another test site for Software International's Fiscal Control/80 financial management package has a different story to tell.

Last October, the user — the Town of Brookline — got back from Software International the \$65,000 it paid for Fiscal Control/80 when it found the package inadequate for its needs, according to a town spokesman who requested anonymity. In this case, no court action was threatened or necessary.

Brookline had agreed to be a test

site for the package. In July, when the package had been in use for about a year, Brookline returned the package with little trouble.

"The system needs some additional work," the spokesman explained. Software International "tailored the system a lot more for manufacturing than for government."

The general ledger part of the package was "superb," but the purchase order and other subsystems were so cumbersome that additional staff would be needed to modify them, he added.

Brookline accepted the risks of a test site while Pittsburgh did not, he said. "We fully understood what a test site is. We understood that it might not go, but Pittsburgh didn't understand what a test site is."

Pittsburgh had additional prob-

lems with the presence of a third-party consultant — Brookline did not employ Coopers & Lybrand — and there was some question as to the city's role in the failure, the Brookline spokesman said.

"It was partly Pittsburgh's fault," he added, contending that Pittsburgh had not adhered to the vendor's specifications. "When you get into an agreement with a vendor, you do what they say, you don't go fooling around with it at night when no one is around. I spoke with Pittsburgh and asked them why they were doing some of the things they were doing."

"Pittsburgh has a political problem," the spokesman continued. "The way the story broke in the press, they had to threaten court action."

## Kentucky, Too, Returns System

FRANKFORT, Ky. — The state of Kentucky experienced problems similar to those of Brookline, Mass., when it served as a test site for Software International Corp.'s Fiscal Control/80. Like Brookline, it did not threaten court action because Software International took the financial management system with no hassle.

Robert Neasham, a systems designer who directs Kentucky's information systems, took partial responsibility for the project's failure, explaining that the state was attempting to accomplish a major overhaul of the accounting systems in only a few months. "It was not a default situation," Neasham said. "The amount of support that Software International put in was fantastic and the general ledger was very good."

The major fault of the package was

that "it was not error free. I couldn't jeopardize the state's financial system," he said.

Neasham did not suffer much damage from the failure of Fiscal Control/80 because he had a backup system waiting in the wings. He is now studying other methods of upgrading the state's system.

When Kentucky decided last April that the four-month-old system was not adequate for its needs, it returned the package without incurring any charges. "We were a beta test site and would not pay for the package until it was fully functional," Neasham explained.

Kentucky, like Pittsburgh, Pa., employed Coopers & Lybrand, Inc. When it turned in the software package, it retained the consulting firm, paying \$700,000 of a \$1.2 million contract.

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# Ansi Endorses a Different Keyboard Design

By Patricia Keefe

CW Staff

A little over 100 years after the introduction of the typewriter, typists' fingers are still tripping over little-used keys in their journey toward the more popular keys, awkwardly placed on the outer reaches of what is called the Qwerty keyboard.

Now all of that may change. Last week, after 12 years of subcommittee debate, the American National Standards Institute's (Ansi) Board of Standards Review adopted the Alternate Keyboard for Alphabetic Machines, which is intended as an alternative to the Qwerty keyboard.

The Ansi X4.22 standard is based on a keyboard design introduced 50 years ago by August Dvorak, a University of Washington professor. Unlike Qwerty, which is named after the first six letters on the keyboard, the Dvorak, or Simplified keyboard, takes into account the frequency of letter usage within a language.

Dvorak supporters claim the keyboard has three advantages over Qwerty: greater speed, fewer errors and more comfort. The X4.22 standard differs from the Dvorak design only in the placement of three punctuation keys.

Advocates such as the Dvorak International Federation and Ansi believe Dv-o-r-a-k will soon spell relief for millions of typists. But, because they will have to learn how to type all over again, user resistance could sound the death knell for the new standard.

Nevertheless, some vendors are pushing ahead with marketing strategies for promoting a keyboard that can be switched from Qwerty to Dvorak and back again. And some users, such as the state of New Jersey, think the new keyboard could save them millions of dollars each year.

Harvard University research associate Richard Land, long a Dvorak supporter, points out that while the design of the hardware itself has come a long way from the first wooden type bars, the keyboard, purposefully designed to be slow to avoid jamming, has remained relatively the same. Since the mechanical problems that inspired the awkward key placement have long since been resolved, Land suggests promoting the Dvorak keyboard, designed for comfort and speed.

## One Step Further

Taking Dvorak one step further, Land would like to split the alphabet in half and place the special function keys in the middle of the board to make them more accessible. This idea is not new. PCD Maltren, Ltd. of England already offers a similar, curved keyboard said to provide tactile feedback to the operator, as opposed to the traditional touch keyboard.

However, Land's first goal is the acceptance of the Ansi standard. His target is what he sees as a whole new community of sophisticated users just now coming on line. Those users, comprised primarily of executives with their first micros and students, will be the easiest to convert because they have not already learned the Qwerty keyboard.

For those earning a living by typ-

ing who may be a bit more set in their ways, Land thinks the standard's three advantages—more speed, fewer errors and more comfort—may win them over. For example, 3,000 words can be typed from Dvorak's home (middle) row alone compared with about 100 words on the Qwerty setup, according to Land.

However, three problems remain for Simplified advocates to surmount: tradition, the costs of hardware replacement and training and motivation. A new generation of typists exposed only to Dvorak is expected to erode tradi-

tion, and the prospect of an increase in productivity of even 5% to 10% supplies the motivation and justifies the cost. "In one year, you could make up the cost of retraining and hardware in terms of increased productivity," Land said.

The software capability for switch-selectable keyboards has been

available from vendors such as Apple Computer, Inc., Olivetti Corp., Eikon Corp., SCM Corp., Wang Laboratories, Inc. and Osborne Computer Corp., according to Virginia Russell, president of Dvorak International Federation. Also, "contrary to what people may think, IBM has been very cooperative," she said.



Standard Qwerty Keyboard (Left) and Dvorak Keyboard (Right)

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CW's April 25 issue will include a Special Report covering manufacturing in transition and the part that computerized systems are playing in that transition. We are looking for articles on how the new manufacturing technologies fit together and what they mean to data processing operations in a

manufacturing environment.

Tutorials on all aspects of computers and manufacturing are welcome. Other areas of interest include user experiences, application stories, studies, management strategies, market forecasts and studies of psychological effects.

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Manuscripts should be sent to Bruce Hoard, Computerworld Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

## Competition Forces Change In Charge Reimbursement

(Continued from Page 1)

sion's recent order explaining how the new reimbursement plan will work. "Moving toward competition and away from monopoly requires that the industry move toward cost-based pricing."

Despite this change, some things remain the same. Ever since 1934, the nation's telecommunications policy has been aimed at promoting universal telephone service and preserving the telephone carriers which provide that service. The new access charge plan has similar goals, Quello said.

The commission's first consideration, he said, was that "the concept of universal service not be sacri-

ficed." The second was to minimize "the threat that the local exchange would be bypassed by large users."

AT&T, he added, "has claimed that 5% of its customers generate 63% of its revenues. By ignoring the threat of bypass, we could only encourage more and more of those large users to leave the local exchange across the country."

According to another FCC commissioner, Joseph Egan, the commission has found an "appropriate balance between the need to encourage efficiency and the need to promote universal service. Under this structure, uneconomic bypass should be discouraged while at the same time there should be no substantial service dislocations."

Others are not so sure. One communications attorney suggested that the FCC's new plan will generate a record number of objections from users and AT&T competitors.

Another possible bone of contention was mentioned by FCC Commissioner Stephen A. Sharp. His point was that since the local exchange network is used for both local and long-distance calls, cost-based rates should be established for each. The FCC's new access charge reimbursement scheme, since it covers only the local exchange costs related to interstate calls, doesn't satisfy this requirement.

Rates for local and intrastate long-distance services remain subject to state regulation at least partly because the states don't want to relinquish control to the federal government. Sharp believes that "as distinctions between jurisdictionally interstate and ... intrastate communications become increasingly blurred ... the desirability of cost-based local exchange rates for each local area will become increasingly apparent."

One problem, however, is that the present scheme enables many business users to obtain long-distance service at bargain-basement rates. This is because they pay a "B-1" rate for local service that enables them to access private long-distance networks.

## More to Be Paid To Phone Firms

(Continued from Page 1)

users, the order stated.

"Before the end of the fifth year of the transition," according to the commission's order, "we will evaluate the rules and policies adopted in this order and, if necessary, will make adjustments."

"We are directing AT&T to prepare the initial ... tariffs to ensure that [the new] access charges will be in place on Jan. 1, 1984."

Since the local exchange costs of handling interstate calls are now assessed entirely against interstate carriers, switching some of those charges to the end user presumably will reduce the carriers' costs. However, it is unclear whether the carriers will charge any less for interstate service.

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# INFOMART



# Exec Finds End-User Productivity Hot Topic

By Jeffrey Boeler

Ch West Coast Bureau

SCOTTSDALE, Ariz. — End-user productivity has replaced hardware and software as the chief topic of interest in DP performance management circles, according to Applied Computer Research, Inc. (ACR) President Philip Howard.

Only five or six years ago, performance management focused primarily on optimizing the operation of corporate mainframes and their associated programs.

Today, however, the emphasis in performance management is rapidly shifting, with attention increasingly being devoted to issues that primarily concern senior executives rather than systems technicians, Howard

said here last week during an ACR-sponsored conference.

## Five Critical Elements

Howard described DP performance management as an enterprise consisting mainly of five critical elements:

- Capacity planning
- A definition of user service objectives and agreements
- Mechanisms for tracking and reporting systems performance
- A means of tuning or adjusting information systems to ensure they meet target performance specifications
- A system of charging application development costs back to non-technical end users

Underlying these five critical management-oriented elements is a much larger base of technological tools and concepts, some of which include hardware and software monitoring, systems modeling and simulation, program optimization, job accounting, statistical analysis and benchmarking, Howard said.

"Of course, you will still be able to manage your system's performance even if one or more of the critical elements is missing," Howard told his audience during a prepared presentation.

"But you really need to have all five if you want to create a truly integrated performance management program," he said.

In communicating with their com-

panies' top executives, information systems managers should keep constantly in mind their target audience's interests.

Variables like response times and throughput may be of great concern to systems technicians, but for high-echelon executives, the only two meaningful measures of DP performance management are people and dollars, the ACR president said.

In an additional tip about how to deal with senior managers, Howard urged information system heads to build a reputation for accurately forecasting their firms' long-term DP performance requirements.

"If you've been seriously wrong [in your predictions] several times in the past, why should the president of a corporation believe you'll be right in the future?" Howard asked.

## Justice Seeks Dismissals In IBM Case

SAN FRANCISCO — The U.S. Justice Department may drop charges against two employees of Japanese firms charged with conspiring to transport IBM trade secrets to Japan.

The Justice Department last week filed an agreement in Federal District Court seeking dismissal of all charges against Kunimasa Inoue, a programmer with Hitachi, Ltd., provided he does not violate any U.S. laws between now and June 30, according to Herbert B. Hoffman, the government's chief prosecutor in the case.

In addition, Hoffman said, the government is planning similar action in the case of Keiko Shiari, an employee of Nissei Electric Trade Co., which did contract work for Hitachi.

In that case, the Justice Department has yet to petition the court formally for dismissal of the charges, Hoffman indicated.

### Minimal Involvement

Both men had minimal involvement in the attempt to ship allegedly stolen IBM documents to Japan, Hoffman said.

The chief prosecutor explained that neither of the men had prior criminal records and that the Justice Department felt prosecution of the two defendants "served no useful purpose."

The two men, along with 16 other employees of Hitachi and another Japanese company, Mitsubishi Electric Corp., were charged with stealing IBM documents following an eight-month undercover Federal Bureau of Investigation inquiry [CW, June 28].

Hoffman said Inoue and Keiko are probably the only two defendants the Justice Department will recommend for dismissal.

The cases against nine defendants in Japan remain open, and one defendant in the U.S. is scheduled for trial May 9.

Three other Hitachi employees pleaded guilty in the case, Hoffman said.

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# Presently Confined to DP Pros

## Society Seen Next Victim of DP-Induced Stress

By Jeffrey Beiler

CW West Coast Bureau  
SCOTTSDALE, Ariz. — Information systems managers have the dubious distinction of being in the "vanguard" of a new and little-understood psychological malady — DP-related stress, according to an expert on computing's impact on people.

The ill effects of DP-induced stress are presently confined to full-time computing professionals, clinical psychologist Dr. Thomas McDonald said here last week during a presentation on performance management sponsored by Applied Computer Research, Inc., a Phoenix, Ariz.-based publisher of systems-oriented literature. But as systems technology proliferates and becomes increasingly accessible to the man or woman on the street, DP stress will gradually spread until eventually it makes its presence felt in nearly every walk of life.

"Society at large will ultimately have as much experience with computer-related stress as DP managers have right now," McDonald predicted during the conference's March 1 keynote address.

### Infant Revolution

From a technical standpoint, today's continuing revolution in systems technology has already met with considerable success. But on the "human" front, the revolution remains very much in its infancy, the president of La Jolla, Calif.-based Transition Associates, Inc. said.

Almost nothing is known at present about exactly how computing affects people. But a recent study conducted by the National Institute of Occupational Safety and Health illuminated the subject at least slightly. The study uncovered evidence suggesting that:

- Among systems professionals, job turnover ranges from 25% to 40% each year.
- Information systems work interferes with the harmonious home life of nearly one in every seven computing specialists.
- The DP profession ranks 12th in the list of the world's 115 most stressful occupations.

## Basic Standard To Be Reviewed

WASHINGTON, D.C. — The American National Standards Institute has announced that its X3 Information Processing Systems committee has approved a public comment period for the Basic standard.

This period will begin in mid-March and last until mid-July.

Persons interested in reviewing the proposed standard should write to X3 Secretariat, Computer Business Equipment Manufacturers Association, 311 First St. N.W., Washington, D.C. 20001 and ask for document X3J2/82-17, titled "Proposed Draft for American National Standard for Basic." They should enclose a check or money order for \$20 for duplication.

"There's a ton of stress in DP," McDonald said. Much of the stress that DPers encounter on the job results from a scarcity of positive feedback, he added. If an application suddenly goes awry, nontechnical end users seldom hesitate to express their displeasure. But rarely, if ever, does either the user community or senior management give corporate computing managers and their employees a pat on the back for a job well done.

In other comments, McDonald reaffirmed the widely held view that nontechnical end users often fear computing and thus resist its introduction in their work places. Some newcomers to DP, especially high-

level corporate executives, are apprehensive about automation because they are afraid it may make them seem ignorant or stupid in the eyes of their subordinates, McDonald said.

Others see systems technology as a threat to their job security — a fear that has at least some basis in fact. Still others, meanwhile, oppose automation out of concern that it might disrupt or reorganize the informal personnel networks where much of a typical company's internal business is truly transacted.

To allay these common user misgivings and remove potential stumbling blocks to increased computer-

ization, information systems managers should encourage upper management to involve itself deeply in a firm's DP activities, McDonald advised. One way of securing increased management involvement is for central computing departments to publicize their successes and thus provide a much-needed counterpoint to the endless chorus of user complaints.

"The measure of success in DP is not how much data or how many systems you make available, but how well you provide nontechnical information that intelligent people can use to make informed decisions," McDonald told his listeners.

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# Major Architectural Firm's Commitment to CAD

By Bill Laberis  
CW Staff

NEW YORK — With a few selections from a limited menu on his screen, architect Paul Gold of Skidmore, Owings & Merrill (SOM) moves a bathroom and eliminates a doorway from a set of working drawings. He can almost instantly review the cost ramifications of his design

changes. He can also automatically update other drawings with his alterations to make sure he didn't place the bathroom in the path of a freight elevator.

Performed manually — which is the way such work is done at many architectural firms — the manipulations and updates would take Gold several hours to complete. Instead,

SOM's commitment to computer-aided design (CAD) enables Gold to "do what they pay me to do around here, namely think."

The company's CAD commitment began 20 years ago with an IBM 1620 and a few simple engineering programs. Today, the voluminous and rapidly expanding data bases of SOM's nine offices are linked via a

Digital Equipment Corp. VAX-based network running under DEC's Decnet. The network, supporting over 100 DEC VT100 CRT terminals, Tektronix, Inc. 4113 graphics terminals and an assortment of plotters and printers, gives the firm technical and administrative support capabilities which, according to one SOM partner, "yield a huge competitive edge in what is really a fiercely competitive market out there."

The marriage of CAD techniques with financial management programs at SOM is the glue binding the administrative and design wings to form a more cohesive planning team. And throughout the 20-year evolution of SOM's computer experience, the firm's homegrown software, developed with tools like Informatics General Corp.'s Mark IV, has been the engine of change in providing SOM with computer-aided architectural capabilities it claims are second to none.

"We became proficient in this kind of programming out of necessity because there never was and still isn't much of any applications software commercially available for our specialized purposes," reported Barry Miliken, systems manager in SOM's New York office. "Each software enhancement grew from an actual design problem. In that way just about everything here is solution-based."

Miliken was quick to add that vir-

## The Challenge: User Resistance

NEW YORK — "The challenge comes in getting architects who spent years learning to draw and design on drawing boards to sit in front of a terminal and access unseen data-bases for a good part of their work. There's a lot of resistance."

Thus, human problems, not technical shortcomings, present the most formidable obstacles to more effective computer applications in architecture or any other business, according to Barry Miliken, systems manager at Skidmore, Owings & Merrill (SOM).

User resistance in the architectural office has several roots, most of which are related to the same implementation problems encountered in any other business setting. Miliken explained. For one thing, the computer used in the design process is totally unfamiliar.

giving. Where human "fudge factors," however slight, can become part of a manually drafted design, "the computer simply says, 'No, you can't do that because it violates the built-in rules.'"

But on the plus side, computer-aided design (CAD) techniques yield accurate, precise results that do not require the laborious reworking demanded by some manually drawn figures, something architects are fast to appreciate. According to John Winkler, a partner at SOM, it is the younger architects and draftsmen in the office who are more inclined to embrace the newer CAD techniques, because many have been exposed to a light pen and terminal in school.

Just as in the implementation of a general-purpose graphics, business or office automation system,

CAD system developers must gain the full support and understanding of upper management — and do so early, Miliken said. Top managers, Miliken maintained in a technical article he is preparing, are "the most likely to be seduced by the hardware itself" because they are the ones who will pay for it. But because "they will probably not be involved in evaluating the operating details of the system, they are also most likely to overestimate and be over sold on its capabilities," he warned.

To ensure coordination of computer purchases and operations at SOM's nine offices and to plan for an orderly expansion of shared data bases, a committee of three senior partners meets about once a month to develop long-range data processing planning and review equipment needs.

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| <b>Systems Design Workshop</b><br>March 14-18 Boston<br>March 20-24 April 1 Boston<br>April 18-22 Seattle<br>May 9-13 Philadelphia<br>May 23-27 Boston<br>June 6-10 New Jersey                                          | <b>Data Communications</b><br>Concepts & Systems<br>March 15-17 Philadelphia<br>April 18-20 Boston<br>May 3-7 Seattle<br>May 17-19 Tampa<br>June 13-15 Boston<br>March 28-31 Boston<br>April 28-31 Philadelphia |
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| <b>Technical Project Planning</b><br>March 14-18 Boston<br>April 18-22 Philadelphia<br>May 9-13 Boston<br>June 20-24 Boston                                                                                             | <b>Effective Presentations</b><br>March 15-17 Boston<br>April 18-20 Philadelphia<br>May 3-7 Seattle<br>May 17-19 Tampa<br>June 13-15 Boston<br>March 28-31 Boston<br>April 28-31 Philadelphia                   |
| <b>Developing Systems Controls</b><br>March 20-24 Boston<br>DP Concepts for<br>New-DB Managers<br>March 10-11 Philadelphia<br>April 18-22 Boston                                                                        | <b>Conflict Management</b><br>in the DP Environment<br>March 15-17 Seattle<br>April 18-20 New Jersey<br>May 17-19 Philadelphia<br>June 13-15 Boston                                                             |
| <b>Writing with POWER</b><br>for DP Professionals<br>April 4-8 Boston<br>March 28-31 New Jersey<br>May 16-20 Philadelphia                                                                                               | <b>Leadership: Managing and Influencing People</b><br>March 15-17 New Jersey<br>April 18-20 Boston<br>May 3-7 Seattle<br>June 13-15 Philadelphia                                                                |
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## Unlike Prime Users

# This User Group Tied Tightly to Its Vendor

By Susan Blakeney  
— CW Staff

WELLESLEY, Mass. — Unlike the Prime Users Group (PUG), the North Eastern System/38 Users Group (Nestu) is small and very young. It is also completely self-funded and quite enthusiastic. Its members' excitement over the IBM System/38 is exceeded only by their excitement over the users group itself.

But Nestu is unlike PUG in another way. PUG's members recently struck a blow for independence from their vendor, Prime Computer, Inc. [CW, Feb. 28] Nestu remains tied tightly to IBM's corporate apron strings.

Even though the group is funded by its 267 member companies rather than by IBM, its speakers come mainly from IBM. Because the speakers strongly discourage press coverage and because Nestu members often rely on IBM's participation at their meetings, there has been no news coverage of Nestu meetings.

The focus of one recent Nestu monthly meeting here, for example, was "System/38 Journal Management," an IBM software system that records changes to data base files. Not only did the group shy away from having its proceedings reported in the general press, the local IBM specialist who addressed the group

asked that his name not be published when approached by a *Computerworld* reporter.

Nestu also has a policy forbidding its members, some of whom are in computer-related businesses, from pushing their respective company's products or services at user meetings.

"Soliciting is outlawed in our by-laws," noted Bill Betrone, a systems analyst at Para Research, Inc. of Rockport, Mass., who is also president and founder of Nestu. But, he admitted, "it's still going to happen, and it has happened."

Betrone started Nestu last April because he was frustrated with the level of service he was getting from

the IBM systems engineering staff. He wanted more and decided to look for help and input from other System/38 users and also to "share whatever I knew."

Recalling Nestu's first gathering, Betrone said, "I told the group to ask themselves this question: Why do you think there are user groups? Is it because the products are so great? Or is it because the products are so intensely complex?"

Whatever the answer, Bill Tansi, manager of software development at Para Research, believes Nestu provides him with "a lot of good food for thought."

Tansi is impressed by his fellow members' level of understanding of System/38 and more importantly by "their desire to understand even more."

### Not Social Meetings

Furthermore, Tansi noted that Nestu meetings are "not social-club-type gatherings... the topics and lectures are very good."

Jenny Misiaszek, assistant manager of data processing at Holmes Transportation, Inc. in Framingham, Mass., concurred: "I've always stayed away from user groups because they were like social events. But this is not true of Nestu."

"Maybe it's because of the nature of the equipment," Misiaszek offered, referring to the relative newness of the System/38. "You learn something at every meeting... if not from the speakers, from the other members."

Misiaszek said she was "bored by Guide (an IBM small systems user group) meetings except when new equipment came out — then it was a fantastic place to learn."

"I think Nestu is serving a great function," she continued. "We're in a continual learning process with the System/38. Eventually, when you get to know about 95% of the computer, user groups have a tendency to change," she theorized. But for the time being, "This user group is different from the rest."

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'As exasperating as it can be for computer professionals' that it will be two to three years before they see a consensus in judgments handed down in computer-related cases, 'the truth is, the process is accelerating.'

## Harvard Law's Arthur Miller Eyes Consensus on DP Law

By Patricia Keefe

CW Staff

CAMBRIDGE, Mass. — He's a Harvard Law School professor and the energetic host of a weekly television show that probes controversial legal topics. He thinks it will take a while before the courts get a handle on high-tech issues.

But not that long a while. Although it took the courts 20 to 50 years to work out their handling of such new phenomena as automobiles, Arthur Miller expects a much shorter "fumbling around" period with computers because of economics and the dramatic impact that technology is having on people.

### Surveillance 'Frightening'

CAMBRIDGE, Mass. — Government surveillance via computers is "frightening" because most victims are unaware that it is happening, Harvard Law School Prof. Arthur Miller said in a recent interview.

"Government surveillance is a part of American life. Surveillance by computers is just another way of doing it," Miller said. Court challenges have not been successful because "the right cases haven't come along."

To combat the threat of surveillance, more public awareness is needed. Public reaction to government spying during the '60s and early '70s resulted in limitations on Federal Bureau of Investigation and Central Intelligence Agency activities. In the Reagan administration, however, the pendulum is swinging back, Miller said.

What happens to information about people, once gathered, is another area of concern to Miller. "The manila folder just doesn't travel as far as the computer entry," he observed.

Precedent-setting court cases will come in time, according to Miller. In a case in which someone has been wronged because an institution failed to safeguard property, its data, the issue was whether a normal, reasonable duty exists to safeguard data. And the day the decision comes down, all systems worth their salt will upgrade their security to ensure their survival, the Harvard Law School professor said.

While Miller predicts it may take two to three years before computer professionals can expect to see any consensus in judgments handed down in computer-related cases, the computer industry can take heart. "As exasperating as it can be for computer professionals, the truth is, the process is accelerating."

Miller cited the exposure of judges and lawyers to computerized legal systems such as Mead Data Central, Inc.'s Lexis and American Jurisprudence Systems, Inc.'s Westlaw as one reason. A way to accelerate the process even more is for computer professionals to design a code of ethics to which the courts can look and from which the courts can borrow. "It is very helpful to have a code of professional responsibilities because it creates a reactive instrument," he explained.

Increasingly, law schools are exposing their students to computers, Miller noted. He himself plans to offer a nontechnical course on the information industry within the next two years.

While federal and state lawmakers are "competent" to handle high-tech issues, Miller said, "lawmakers require a great deal of education. I think they realize that high-technology assessment and policymaking is a high priority, and that it is important that they be able to learn what they have to."

The hearing process that follows the introduction of new bills can be an educational forum for lawmakers and give the affected parties an opportunity to provide relevant education via their presentations to congressional committees, he added.

Despite his emphasis on education, Miller was quick to stress that the current legal structure is capable of handling computer-related crime. But while it is "not important to have new principles enunciated that are unique to high-tech issues," this does not mean laws specifically related to computer crime should not be passed.

Passage of computer-specific legislation "would help by cutting the mumbo-jumbo metaphysics, [for example] whether theft statutes apply to information, and prevent lawyers from playing their little games. And it would have a tendency toward a psychological factor to say, for example, 'There is no doubt that stealing from computers is like stealing from humans,'" Miller explained.

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## Vendor Panel Explains OA Solutions

By Jim Bartimo  
CW Staff

PHILADELPHIA — Different groups within the office have different needs. Three vendors were asked to explain how their communications-oriented products filled those needs at a session on OA architectures here at the recent Office Automation Conference (OAC '83).

"Wang [Laboratories, Inc.] solution is: each, according to their needs," explained Peter Thornton, senior product manager of networking. "Different groups have different problems and one solution is the cable bus, broadband Wangnet. The benefits of [a broadband network] are that everything happens concurrently on the same wire."

"The problem we're all working on is to improve productivity and responsiveness in the office. The goal is to tie managers, executives and secretaries together," according to John F. Shoch, vice-president of the Office System Division at Xerox Corp.

### Four Approaches

There are four approaches to tying the office together, Shoch said. One is the centralized data processing approach in which all functions eventually trace back to a host computer. Another is the use of a private branch exchange as the center of the office — tying all functions through the existing telephone network.

A third method is to give all office workers their own stand-alone personal computers; however, this does not allow them to share resources, Shoch observed. The fourth method is a distributed architecture of powerful workstations tied together in a high-speed local network. "This, of course, is our method," he said.

Because the office is a multifunction environment, an office system must also be multifunction, Steen said. Achieving full integration of these functions "is probably more complex than any computer problem we've had," he noted.

Finally, Bob Steen, director of architecture and telecommunications for IBM, said that IBM's approach to filling these needs involves its Systems Network Architecture, which offers physical interconnection, logical means of communication, application-level compatibility, systems integration through protocol conversion and a friendly user interface.



# Speaker Outlines OA Implementation Strategy

By Jim Bartimo  
CW Staff

**PHILADELPHIA** — The most important factors in implementing a successful office system are support from top management, a long-range corporate strategy and a well-planned pilot project, according to Susan S. Kay, senior consultant at Hannagan and Associates of Chicago.

Speaking here at the recent Office Automation Conference (OAC '83), sponsored by the American Federation of Information Processing Societies, Inc. (AFIPS), Kay made her comments at a session titled "Strategic Planning and Implementation Issues."

"Top management is interested in only two things: profitability and success," Kay said. "They want to make a big splash." Factors that influence senior management to accept office automation are an overload of paper, demands on their own time and a reluctance to trust the corporate DP department.

An office automation manager or project leader should ensure that he has the support of at least one member of senior management, and he should think of that person as a sponsor. This sponsor will help the office automation project by praising it to his peers, Kay said, which will help the manager maintain his mandate.

When developing an office automation strategy, the

manager should consider user needs first and technology second. "Too often, office automation is based on the existing technology," she said. "This will not get your project legitimized."

Pointing out that a strategy should see the manager through to implementation, Kay said there are a number of guidelines to keep in mind. The plan should include an integrated office

system that incorporates whatever capabilities are needed, such as voice, data, text and image. Second, the planner should be sure he designs an office system that serves the needs of executives, middle management and secretaries alike.

Perhaps most importantly, the strategy must consider the needs of the entire corporation, not just the department that will be automated

first. "Office automation, like data processing, will eventually become a corporate system," Kay said.

Kay pointed out that the term "pilot project" has a different meaning in the office than it does in DP. "The purpose of an office automation pilot project is not to test the system [as in DP] — it's for the benefit of the users."

The key aspect of a successful pilot project is select-

ing the right department as the test site. "Spend a lot of time choosing the pilot site," Kay advised. "I've spent half a day to a full day helping my clients decide which department should be used."

Once the pilot project is in place, the manager should not only help the users with the currently installed equipment, but encourage them to grow into more sophisticated applications.

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### MPG Meeting Set for May 11

**CHICAGO** — The 8th Annual Mathematics Products Group (MPG) Roundtable Meeting, for users of Mathematics Products Group, Inc. software, is slated to take place here May 11-13.

Five plenary sessions are scheduled in addition to 36 user presentations and 24 workshops. Six sessions addressing new products are on the agenda.

Early registration for the event costs \$350. Additional information can be obtained from Jonathan Smith through MPG, P.O. Box 2392, Princeton, N.J. 08540.

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THE TELETYPE UNIT

# Marketing Rep Warns Micro Buyers to Beware

By Bruce Hoard

CW Staff

**PHILADELPHIA** — The personal computer selection process should be carefully planned and meticulously executed, Barbara D. Stendal, product marketing representative with Ryan-McFarland Corp., told a session here at the recent Office Automation Conference (OAC '83), sponsored by the American Federation of Information

Processing Societies, Inc.

Stendal walked attendees through the process she had traveled in deciding on and then purchasing personal computers, but first warned that a personal computer may not be the right piece of hardware for their needs. She also said potential buyers should distinguish between good personal computers and good marketing pitches. One way to do that is

to ask all sales representatives the same questions.

Stendal's company was looking for a way to handle 50,000 to 70,000 daily transactions. There was a need to move the point of data entry into the client's stores.

The expected payoffs were a reduction of manual labor, lower operating costs and three to five fewer days of processing time. The re-

quirements for a solution included the placement of the data entry in the store, a sturdy piece of hardware that could withstand precipitous temperature changes, credit authorization capabilities and enough storage capacity to save transactions until it was economically feasible to make data calls to a computer.

When the search for a solution began, Stendal did not

know if personal computers were the answer. Ryan-McFarland also considered 10-key credit terminals, but passed on them because they lacked communications capabilities. Dumb CRT terminals were dismissed because they lacked sufficient storage capacity.

Although the initial outlay for micros was high, they fulfilled all the basic requirements and Ryan-McFarland decided to go with them. To determine which one was best, it used an evaluation matrix.

## Reliability Most Important

"Our most important criterion was reliability," Stendal said. Looking into possible future repair situations, she discovered the full service contract, which charges a high monthly fee whether or not repairs are done. She finally settled on a time and materials-based service contract.

Noting that one major vendor has 16 repair centers nationwide while another has more than 2,000, Stendal said that personal computer purchasers should take shipping costs into account and make sure they can just ship the part or parts that require repair.

One vendor was willing to ship and install its personal computers anywhere in the U.S., while others charged shipping and installation fees. One vendor required her to instruct remote users on how to assemble their micros over the phone; another offered a machine that shipped out of its box and plugged into the wall. "Everybody claimed installation would be very easy," Stendal declared. "There really is a wide range of ease of installation."

In looking at warranties, she found that they ran between 30 and 90 days.

Ease of programming was also important to Stendal's company. She did not want her Cobol-trained programmers to have to learn a new language. "That was overhead we didn't want to pay for," she said.

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## Budget Cuts Force Louisiana to Cancel Personnel System

By Susan Blakeney  
CW Staff

BATON ROUGE, La. — The state of Louisiana is canceling a \$7 million consulting contract to develop a centralized state personnel system because of severe budget cuts. The system would not have been compatible with the state's network of IBM processors. Arthur Andersen & Co. was working on software for a Personnel Management Compensation System for Louisiana's Division of Administration and the Department of Civil Service. The program was to run on the division's leased Honeywell, Inc. computers.

But the state took a closer look at the consulting contract when the budget as fell late last year. It realized that the Honeywell-based system would probably never be able to communicate with the state's IBM and IBM plug-compatible equipment.

"We've decided to change our direction and streamline operations," explained Len Sanderson, assistant commissioner of administration for the state of Louisiana.

"We decided to position ourselves so that we can better communicate. Plus, there's more IBM-compatible software to choose from," he said.

Louisiana's Honeywell equipment has "long been a

bone of contention" among other state agencies because of its incompatibility with their IBM installations, according to Sanderson.

"We kept waiting for this 'magic box' that was supposed to allow our machines to talk to each other... and it never came," he said.

State programs now running on the leased Honeywell equipment will be frozen, Sanderson said, and the IBM migration will be launched.

"We're going to reorganize the information office within all state offices. We're coming to a recognition that data processing, telecommunications and office automation have to be hooked together somehow, and that's what we're trying to accomplish," Sanderson said.

He added that the cancellation of the contract had nothing to do with any deficiency on the part of Arthur Andersen, which has already collected some \$500,000 in consulting fees from the state.

"They did their job," Sanderson said. "They developed the program for an automated and integrated system. We just had to change our direction."

Sanderson reported that the state's new, scaled-down data processing plan calling for IBM equipment will cost the state roughly \$3 million.

## Town Receives B1995, Then Puts Out for New Bids

NORTH BERGEN, N.J. — Public bids are now being accepted by this town for a new computer system, although it recently received a Burroughs Corp. B1995.

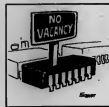
The bids are being accepted because the town's Board of Commissioners learned that the Burroughs machine had been ordered before the required 10 days of bidding was allowed.

According to Finance Commissioner Charles Haas, the computer was ordered to expand the township's existing Burroughs 8800-based Data Processing Department. After conducting an informal evaluation of industry equipment himself, Haas said he picked the Burroughs system because Burroughs told him its B1995 system was the only computer on the market that could be used with the town's 8800 system and related software.

New bids, due March 8, will be evaluated by the pur-

chasing and data processing departments on the basis of the town's needs. Haas does not know if the town will just keep the B1995, which is still in its box, but described the system as "what we want."

Haas also denied allegations that he committed any bidding violation, and does not feel there's been any foul play on the part of Burroughs. He said the existing software is all Burroughs-compatible, and does not feel another vendor could fulfill his needs any cheaper.



# Consultant Profiles Typical Computer Felon

By Jim Bartimo  
CW Staff

**DEDHAM, Mass.** — A computer felon is usually between the ages of 18 and 40, male — and a nice guy.

According to the U.S. Justice and Treasury Departments' profile of a computer felon, he is also aggressive, trusted, has no prior criminal record and usually works alone, consultant John R. Maples told a recent Northeastern University seminar on "Industrial Espionage in High Technology" here.

Maples, who is senior vice-president of operations and training for Special Security International Corp. of Roanoke, Va., spoke about computer security from the corporate security director's point of view.

## Background Check

Because the computer felon often cracks the computer system out of financial need, Maples suggested that

## Security Expert Categorizes Industrial Spies

**DEDHAM, Mass.** — "Most countries spend more money trying to get our technology than they spend developing their own," George Van de Water, senior Western representative of a security consulting firm, charged here recently.

Speaking at Northeastern University's seminar on "Industrial Espionage in High Technology," Van de Water said that California's Silicon Valley alone lost \$20 million through industrial espionage. He also claimed that 40% of all Eastern bloc personnel in the U.S. working as diplomats and journalists are actually skilled espionage agents.

Threats to high-tech industries come from both the Eastern countries and "friendly competitors," such as Japan, said Van de Water, who is with Special Security International Corp. based in Roanoke, Va. He pointed to IBM's recent espionage episode as an example.

According to Van de Water, there are three categories of industrial spies: opportunists, who do not actually perform any espionage but tell professional agents about high-tech personnel who might be likely candidates to turn over industrial secrets; semiprofessionals, who are often used by smaller businesses and are often private detectives; and professionals, who are seldom caught and make their livelihoods by extracting information from one company and providing it to another, usually outside the U.S.

It is difficult to determine if high-tech espionage is on the rise because good spies are not caught and the majority of discovered cases go unreported, saving a company from embarrassment and the possible loss of government contracts, Van de Water said. "Information leaks become better guarded than the information that was lost," he commented.

"Security is like insurance," Van de Water continued. "It's too expensive until you need it and then it's too late."

a thorough background check be performed on all data processing professionals, including a check on their credit rating.

He identified four ways in which the computer felon is likely to strike:

- Physically. "This ranges from actual vandalism and damage to equipment, to information destruction, falsified entry and fraudulent use of data." As an example, Maples pointed to a group of New York high school students who used a classroom terminal to dial into a Canadian corporate data system.

- Transactionally, by tapping into a computer system under the auspices of a legitimate user, usually to divert funds electronically.

- Via programming, by altering a

computer program to gain computer time or data or to divert funds. Maples cited the recent theft of \$21.3 million from the Wells Fargo bank engineered by two bank employees and a sports promoter.

- Electronically. "This ranges from illegal use of a personal computer system to access classified data of a business to wiretapping of communication lines to obtain proprietary information or divert funds."

There are times when a company should fear not only individual criminals, but competing companies. "People think that only product information is in danger, but so is marketing and personnel information," Maples explained to the attendees at the seminar.

Maples gave the example of one DP professional who printed out employees' resumes for sale to a headhunter.

Leaving software security to DP professionals, Maples suggested that hardware can be secured best by a multilevel system — posting obstacles outside the building, outside the computer room and at the equipment itself.

"Card-key security is probably the best thing going today," Maples said, pointing out that the more expensive fingerprint identification system has roughly a 6% error rate in both preventing authorized personnel from entering the computer room and allowing unauthorized personnel into that area.

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## Calendar

## Week of March 13

March 17-18, Dallas — **Local Networks: Promise Into Practice.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424

## Week of March 20

March 21, Columbus, Ohio — **DOS/VIS Job Management.** Contact: Gals Systems International, 5455 N. High St., Columbus, Ohio 43214.

March 21-22, Hartford, Conn. — **Testing in the Cobol Environment.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

March 21-22, San Francisco — **Computer Litigation: Resolving Computer Related Disputes and Protecting Proprietary Rights.** Contact: Practising Law Institute, 810 Seventh Ave., New York, N.Y. 10019.

March 21-23, San Francisco — **Improving Office Productivity: Principles and Practices.** Contact: Seminar Department, Dataput Research Corp., 1405 Underwood Blvd., Delran, N.J. 08075.

March 21-23, Washington, D.C. — **Word Processing Systems: Planning, Design, and Programming.** Contact: Seminar Department, Dataput Research Corp., 1405 Underwood Blvd., Delran, N.J. 08075.

March 21-23, San Francisco — **Financial Information Systems.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

March 21-23, Zurich, Switzerland — **International Symposium on the Performance of Computer-Communications Systems.** Contact: IBM Zurich Research Laboratory, Säumerstrasse 4, CH-8803, Rüschlikon, Switzerland.

March 21-23, Toronto — **MVS Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

March 21-23, San Francisco — **Financial Information Systems.** Contact: National Institute for Management Research, Department D, P.O. Box 3727, Santa Monica, Calif. 90403.

March 21-25, Cambridge, Mass. — **C Programming Workshop.** Contact: Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

March 21-25, San Diego — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

March 21-25, Dallas — **Managing the Audit of Computer-Based Bank Systems.** Contact: Bank Administration Institute, P.O. Box 93879, Chicago, Ill. 60673.

March 21-25, Buffalo, N.Y. — **Basic Systems Analysis.** Contact: Association for Systems Management, International Headquarters, 24567 Bagley Road, Cleveland, Ohio 44130.

March 21-25, Washington, D.C. — **How to Increase the Productivity of Computer People.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

March 21-25, Boston — **Information Engineering Revolution.** Contact: Susan Johnson, Information Methods, Inc., 504 Totten Pond Road, Waltham, Mass. 02154.

March 21-25, Los Angeles — **IMS/VIS Data Base Design.** Contact: Data Base Management, Inc., 1075 Tolland Trpk., Manchester, Conn. 06040.

March 21-25, Boston — **Informa-**

**tion Engineering Revolution.** Contact: Information Methods, Inc., 504 Totten Pond Road, Waltham, Mass. 02154.

March 22-23, Zurich, Switzerland — **Office Automation Conference and Exposition.** Contact: U.S. Department of Commerce, P.O. Box 1065, 3001 Bern, Switzerland.

March 22-23, Washington, D.C. — **Factory of the Future.** Contact: Center for Manufacturing Technology, 4170 Crossgate Drive, Cincinnati, Ohio 45236.

March 22-24, Washington, D.C. — **Federal ADP Software Conference.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

March 22-25, Los Angeles — **De-**

**signing VLSI.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 22-25, Orlando, Fla. — **Teacher '83 — World Fair for Technology Exchange.** Contact: Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32075.

March 22-25, Washington, D.C. — **Embedded Computer Systems.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 22-25, Boston — **Real Time System Design for 8- and 16-bit Microprocessors.** Contact: Integrated Computer Systems, 3304 Pico Blvd.,

(Continued on Page 28)

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## Seminar Set On CAD/CAM

CAMBRIDGE, Mass. — Arthur D. Little, Inc. will hold a one-day seminar on computer-aided design and manufacturing (CAD/CAM) titled "Beyond CAD/CAM: Forging the Factory of the Future Through Computer Integrated Manufacturing" in four cities during March.

Seminars are scheduled for Boston, March 17; Los Angeles, March 21; Houston, March 23 and Atlanta, March 25.

The seminar costs \$500 with a half-price discount for a second member from the same company. Arthur D. Little is located at Acorn Park, Cambridge, Mass. 02140.

## Lowell to Speak At TCA Show

PHOENIX — Former Apollo astronaut James A. Lowell will be featured as the keynote speaker at the Communications Roundup telecommunications show, being conducted here by the Tele-Communications Association (TCA) April 11-13.

Lowell, commander of the Apollo moon mission during the Apollo 13 flight, Now retired from active U.S. Navy service, he serves as senior vice-president of administration at Centel Corp.

Registration for the TCA conference is \$50 for members and \$100 for others. Further details are available from the association, located at Suite 333, 350 N. Central Ave., Phoenix, Ariz. 85012.

## Martin to Speak At Info Meet

WASHINGTON, D.C. — Industry guru James Martin will be the keynote speaker at the Information Engineering Conference which will be sponsored here March 16 by Applied Data Research, Inc. (ADR) and Database Design, Inc. Martin will discuss the corporate data model as a basis for productivity.

Other topics include developing a corporate data resource, creating a broad base of information users and accelerating application development.

The conference is free to ADR/Datatum customers and prospective customers on a first-come basis. ADR is located at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

## DP's Effects On Humans Topic of Meet

TALLAHASSEE, Fla. — A conference studying the human effects of the computer age will be held by Florida State University (FSU) here March 14-15.

"The Third Hemisphere" will address topics including "The Human Mind: A Perspective on Human Capabilities," "Social Change in the Computer Revolution" and "The Question of Artificial Intelligence."

Privacy in the computer age will be a theme of the conference. A panel discussion will include representatives of the American Civil Liberties Union, the Florida Attorney General's Office, the Credit Bureau of Tallahassee, the League of Women Voters and the national news media.

Registration for the two-day conference is \$15. Hotel rooms are available at a group rate from the Tallahassee Hilton.

More information can be obtained from the Center for Professional Development and Public Service, Florida State Conference Center, FSU, Tallahassee, Fla. 32306.

## Honeywell Gives Futurist Awards

MINNEAPOLIS — Honeywell, Inc. has announced the 10 winners of its nationwide college student Futurist Awards Competition.

The winners are William Graham of the University of Pennsylvania, Michael Insnardi of MIT, Philippe Byrnes of the University of Illinois, Dana Ikemati of the University of California, Stacy Thompson of Purdue University, Victor Riley of the University of Arizona, Anthony So of the University of Michigan, Robert Bruns of the University of Colorado, Henry Gerber of Iowa State University and Michael Palmer of the University of Illinois.

The students were asked to write an essay predicting what the year 2000 would hold for four of six areas of technology, then write a fifth piece explaining what impact their predictions would have on society. One student anticipates marine-based petroleum synthesis, linear-space vehicle accelerators and an inter-revolution of computers in the year 2000, according to a Honeywell spokesman.

Each winner will receive a \$2,000 prize. Those students, majoring in electrical, computer or mechanical engineering or computer science will be offered summer internships with Honeywell.

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(Continued from Page 26)

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March 24-26, Pittsburgh, Pa. — **Vsam Performance Workshop.** Contact: Solutions, Inc. Box 989, Montpelier, Vt. 05602.

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## Calendar



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# Rep. Markey Likens AT&T Breakup to Divorce

By Jim Bartimo  
CIV Staff

BOSTON — The breakup of AT&T is much like the breakup of a marriage, Rep. Edward J. Markey (D-Mass.), a member of the Telecommunications Subcommittee of the House of Representatives Energy and Commerce Committee, said here recently. "One side gets the house, the car and the summer home — the other side gets all the bills and the mortgage payments."

But even with a messy divorce going on, someone has to watch over the telecommunications industry, Markey told a meeting of the Boston Bar Association. Since neither the courts nor the Federal Communications Commission seems willing to regulate it, Congress must monitor AT&T's divestiture of the Bell operating companies to ensure that there is competition in the industry, Markey said.

The congressman pointed to one area where divestiture has already been a problem. "[American Bell, Inc.] was introducing products two weeks after it was born," he said. "Now, American Bell didn't develop these products in two weeks." Since the research and development for these products took place while the operating companies were still part of AT&T, "the question is: Who paid for this R&D and who should benefit?" he said.

## Suspicious Relationship

Voicing suspicion about AT&T's relationship with the operating companies, Markey said that AT&T has allowed the sale of terminals by the operating companies to flow to itself. "There are strong indications that AT&T is preventing the [operating companies] from acting in their own interests," he said.

Congress will also monitor access charges, the solvency of the operating companies and local rates, Markey said.

However, while Congress may monitor local rates, they will still go up in cost, according to another speaker at the meeting, Richard W. Blackburn, general counsel of New England Telephone and Telegraph Co., outlined AT&T's plan for divestiture saying, "By any measure, the job is monumental."

Part 1 of divestiture will be to de-

termine which facilities remain with AT&T and which remain with the operating companies. When the facilities, personnel and accounts have been divided, AT&T will have retained 25% of the business, while the operating companies will have received 75%, Blackburn said.

Part 2 of divestiture will allocate the technical resources of AT&T to the operating companies, and Part 3 will reorganize contracts within AT&T, Blackburn said.

Finally, the last part of divestiture will give the intranet telephone services and the printing of the Yellow Pages to the operating companies, while AT&T retains the interoffice telephone services and terminal sales.

Expected to be complete by the last quarter of 1983, divestiture still poses some problems to the telephone giant, such as the definition of local access and transport areas. In Massachusetts, for instance, there are two area-code districts. The question still remains whether AT&T or the operating companies will provide the telephone service between the two area codes or if that type of call will be considered long distance, Blackburn said.

Another problem is which entity will pay for the local loop. Because it is expected that the local loop will be paid for by the operating companies, local rates will rise as this charge is passed on to the customer, Blackburn predicted.



By Photo by J. Bartimo

American Bell "was introducing products two weeks after it was born. Now, American Bell didn't develop these products in two weeks," Markey observed.

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## EDITORIAL

### Smooth Sailing

The largest computer company in the world recently reshuffled its top management, and industry watchers barely blinked.

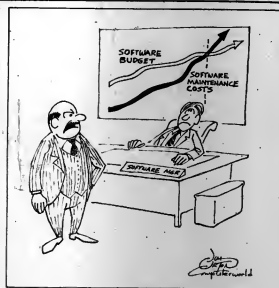
Not that the internal machinations of IBM weren't of some concern. It is simply that there may not be another company in the world that plays management chess more adeptly than IBM.

The moves were crisp and definitive. Frank Cary bowed to "old age" (he's 62), stepping down as chairman of the board, a post he held for 10 years. John Opel, former IBM president and chief executive officer, replaced Cary as board chairman and continues as CEO — the top two slots in the corporation. And John Akers, a personable 48-year-old marketing executive, is now president and logical successor to Opel.

IBM announced several other upper management changes, each executed with the computer-like precision that underscores the company's commitment to long-term management planning. Small wonder that a management survey conducted by *Fortune* magazine rated IBM the most admired, best-managed corporation in the country, while *Dun's Business Month*, in its recent annual review, rated IBM in the top five American best-managed companies.

Perhaps most important, the management changes occur at a time when IBM is at the peak of its game. The company reported strong operating results in 1982, the nation's worst business year in decades. Under Cary's leadership, IBM has penetrated new markets outside its traditional mainframe stronghold. Whether in personal computers, graphics terminals or information services, IBM has demonstrated an implacable ability to capture quickly a dominant share of any new market it enters.

This must be comforting indeed to the "new" management team, which will now ride the crest of a wave generated largely during Cary's tenure. For IBM's competitors, this means trying harder than ever to tread water in a Big Blue ocean.



"Tinkler, Around Here That's Not What We Mean by 'Break-Even Point!'"

## LETTERS

### 'Not' Picking a Winner

It was with high hopes that I began to read Girsh Parikh's In Duple article "How to Pick a Winner: A Look at Software Methodologies" (CW, Feb. 14). I am reasonably well-informed about the various software methodologies and feel that a good article on the subject was long overdue.

Shortly into the article, I was surprised by a serious inconsistency. Parikh used a common categorization of methodologies (with which I disagree) into data structured and functional. However, I became confused as to his differentiation of these categories when he included data flow diagrams in the latter and Thomas DeMarco's structured analysis, which is based on the use of data flow diagrams, in the former.

Next, I was somewhat taken aback by Parikh's rather transparent suggestion that "an independent observer, preferably an outside consultant," be a standing member of the evaluation team. Parikh is described in the article's biography as "a Chicago-based consultant."

But these annoyances proved minor once I came to understand what Parikh was suggesting, namely, a sort of methodology play-off, which would require a 14-member team (one of whom is the outside consultant) if four methodologies were being considered.

Making reasonable assumptions about coding rates, training time and the like, it would take at least several months (probably more like half a year) before even a preliminary decision would be made (Parikh suggests that the experiment could take over a year).

Just in personnel costs alone, this experiment would cost, in terms of direct salary and fringes, over \$200,000. Additional costs for train-

ing, purchasing/leasing methodologies, computer time, travel, secretarial support and so on would almost certainly add another \$50,000 or so.

I was trying to think of how many firms could free over a dozen people from their systems staffs for over six months and spend over \$250,000 to select a methodology (Parikh suggests that more than one might be selected) when it occurred to me exactly where things had gone wrong: Perhaps Parikh's article was meant to read "How Not to Pick a Winner."

Fred L. Forman  
Oakton, Va.

### Entry-Level Program

The editorial "Buying Certification" (CW, Feb. 14), makes some important points about the distinctions between professional certification programs and educational programs and certificates.

In discussing attempts "to bolster professionalism" the editorial mentions Bank Administration Institute's program, the Certificate in Bank EDP Auditing. It should be made clear that the program in question is not for professional certification. If it were designed as such, the requirements for experience and continuing education would be comparable to our Chartered Bank Auditor program, which is a highly recognized professional certification.

The Certificate in Bank EDP Auditing is an educational program for entry-level DP auditors. A curriculum of courses and case problems is meant to provide the structured training and experience that auditors need before they can become fully qualified to perform DP audits.

James R. Pastorello  
Executive Vice-President  
Education Directorate  
Bank Administration Institute  
Rolling Meadows, Ill.

## DATA PAST

### Five Years Ago March 6, 1978

WASHINGTON, DC — The Justice Department will decide "soon" whether to ask for interim relief when it finishes presenting its antitrust case against IBM, Assistant Attorney General John H. Shenefield said at a trade association meeting here.

The head of the department's Antitrust Division declined to tell the members of the Computer & Communications Industry Association at its Fifth Annual Caucus here just what form of relief the government plans to propose in the middle of the nearly three-year-old trial.

### Ten Years Ago March 7, 1973

DETROIT — Burroughs Corp. filled the gap in its small computer series with two B7000 systems. The B7000s have from 32K to 48K bytes of core and fall between the L8000 series minicomputer and the B1700.

Described as a "perfectly valid" alternative to the smaller IBM System/3, the B7000 combines some of the design concepts of the B1700 with an ease of operation Burroughs felt was necessary for the less sophisticated user.

WASHINGTON, DC — AT&T asked the Federal Communications Commission for approval to revise its private-line rates to compete with the specialized common carriers. The rates would affect more than 19,000 private-line users.

Under the proposal, Bell would set up a two-level rate structure based on high-density and low-density routes and monthly rates would drop from \$3/mile to 85 cent/mile.

NEW YORK — Digital Equipment Corp. introduced a mainframe in minicomputer clothes. Called the Decsystem-2020, the system extends the firm's mainframe line down into the IBM 370/115 range.

DEC also introduced the Decsystem-2060, a system that expands the capability of the firm's -2050.

LECHT ON SCIENCE / Charles P. Lecht

# A Turn of the Screw for U.S. DP Industry

Recent proposals to deny investment tax credit benefits to companies purchasing certain Japanese imports mark the start of a significant development on the stage of world computer technology in 1983. More of the same, involving France, West Germany, England, Italy and, possibly, Korea, will follow as these countries, together with Japan, become capable of technological self-sufficiency and wage truly competitive wars for capturing the marketplace.

Even countries with little or no computer systems manufacturing capability are showing signs of increasing independence from the American technological umbilicus through which they've been nourished for 30 years. India and Brazil typify this group. Whatever the outcome of their current attempts to create their own computer industries, the emergence of multiple non-U.S. sources to meet their technological needs will quite naturally lessen our trade opportunities.

Shrinkage of our marketplace share is hard enough to take when it derives from saturation, local economic decline or diminishing product interest. However, when we step to consider that this erosion of our competitive position is the unsought result of unmatched and massive global investment by the American scientific community itself, it's a particularly painful turn of the screw.

## Look-Alike Alternatives

Today, most of the world is computing on systems of American design. Systems manufactured by American companies either in the U.S. or outside of it, and those foreign-manufactured systems that provide users with look-alike alterna-

tives, command over 90% of sales.

Today's computer people have, for the most part, grown up with the belief that computers are as American as kielbasa is Polish. Even the Soviet Union's Minsk line is an American look-alike. Additionally, the only profitable systems products manufactured by foreign companies with foreign ownership fall into the look-alike category.

Alarmed at increasing global competition, and battered by swiftly decaying product value, American computer and communications systems manufacturers are seeking, not surprisingly, to make government intervention (protection) a part of their defensive strategies. The volume of this rising chorus for governmental intervention is unprecedented in America's computer industry, which traditionally has resisted any active role for government save that necessitated by matters bearing directly on national defense.

## Seeking Government Help

For example, having protested our government's intervention in its own affairs, IBM, the world's largest and most successful computer systems manufacturer, recently saw the wisdom of seeking our government's help to protect its business from foreign alleged copycats.

Others in the Computer and Business Equipment Manufacturers Association are seeking similar help as their foreign marketplaces fall increasingly under local government control. Whatever the immediate provocation, this higher government profile reflects profound changes that critically affect marketplaces for our computer technology both at home and abroad.

Providing the impetus for this increasing government participation is the most crucial development within our industry of recent days: to wit, the synthesis of computer and communications systems technologies.

## FTT Monopolies

In America, this, along with communications deregulation, is fostering the emergence of information systems companies purveying both technologies and the services relating to their support, for example, IBM and AT&T. This is not the case abroad, where the government-owned, Postal Telephone and Telegraph (PTT) Administration monopolies are in the process of absorbing their private computer industries or, at least, positioning themselves to control their future.

In France, England, West Germany and Japan, governmental influence over indigenous computer industries is at an all-time high and growing. Having already experimented, to a greater or lesser extent, with imposing technological criteria for component interface between communicating systems, increasing subsidies to computer manufacturers and providing buy-locally tax incentives, foreign governments are finally recognizing the value of their FTTs as instruments for achieving the degree of control they seek over high-tech expenditures made within their borders.

The significance of such control is only fully understood in a wider context. By using their FTTs' communications channels as leverage, governments can reach for near total control of all DP businesses. After all, contemporary computer systems architectures depend upon these

linkages for their very existence.

This presents governments with an irresistibly available means for dominating activity in the local DP marketplace. And, by inevitable extension, such dominance has enormous implications for general commerce, population control and conflict management, among other issues, far more than we can adequately address here.

## Captured Electronically

For the moment, they view this critical, all-pervading position simply as a means to lessen their dependence upon foreign products and services, to increase the number of alternative supply channels and to grab an increasing share of the world's growing computer and communications marketplace. But their actions, whether conscious or subconscious, anticipate a world where in entire countries may be captured through electronic means, and the nice, chocolate-vanilla distinctions we presently draw between nuclear and conventional conflict are rendered moot for having been superseded by not merely computerized, but computer-resident, engines of war.

In its Jan. 3, 1983 issue, *Time* magazine stated that IBM holds 62% of installed base in the non-U.S. marketplace. Factor in Honeywell, Inc., Sperry Univac, Burroughs Corp., NCR Corp. and Control Data Corp. and we hold over 80%. The point is that already our refusal to sell DP systems or their components to any developed country could damage that country's industry in such a way that it could be neutralized electronically.

(Continued on Page 34)

HUMAN CONNECTION / Jack Stone

# Incorporate Common Courtesy When Hiring

My article "DP Experience Hiring or Nurturing From Within?" [CW, Nov. 29] prompted many reader responses. Two readers in particular expressed rather unusual views.

Carl Adler, a systems programmer with Unicom Research and Development of Seattle, introduced an interesting comparison between programming resources and natural resources.

"The issue of training in-house vs. hiring prefab talent has hit close to home. Recently, a friend of mine was let go from a local software house because the firm could not afford the time it was taking to train her. The firm obviously felt that it was better to hire experience and pay whatever it takes to attract it than to cultivate it in-house.

"There's a problem in this attitude that most managers don't want to deal with — a friend calls it 'the ecology of programming resources.' The problem can be expressed in this way:

"If a firm only hires experienced, expensive talent that will be produc-

*This is the second in a two-part series titled "Should We Hire or Nurture DPs?"*

ive immediately, then only those individuals will get the new experience, which they don't particularly need. There is clearly a shortage in these kinds of programmers — how else could they demand and get the kind of salaries they do?

"Since there is a shortage, a manager will need, if not expect, experienced programmers to work a little harder and a little longer than normal. So it seems that there is a relatively small number of crack coders doing most of the work."

"Since there is a shortage, a manager will need, if not expect, experienced programmers to work a little harder and a little longer than normal. So it seems that there is a relatively small number of crack coders doing most of the work."

"There is an interesting correlation between replacement of our present staff and the replacement of our natural resources. Just as our myopic neglect of the earth is

creating problems, our myopic view of DP personnel policy is creating problems in the DP industry.

"We can prevent both ecological situations from worsening by taking a larger view. Almost everyone now understands that we have to use our natural resources carefully and that we cannot continue to burn them up and throw them away. The DP industry must understand that it, too, cannot continue to use up, burn out and throw away its limited programming resources."

## Common Courtesy

Joseph Mangraviti of Brooklyn, N.Y., suggested that the issue can be resolved through common courtesy.

"Outside hiring, instead of promoting qualified DPs is a plague. I've been working with computers for a few years, most recently as a programmer/analyst for the Hong Kong and Shanghai Bank at the World Trade Center in New York.

"I started my career from the very bottom of the ladder, as a keypunch operator, and worked for Company

A for two years. Every time there was an opening for a computer operator or programmer, I applied for the job, but never got it in spite of the fact that I had a certificate in programming. One day, Company A hired from Company B a computer operator who had no experience in the field. I was mortified.

"Later on, I applied for a computer operator trainee position at Company B, and I won the job! Neither Company A nor Company B gained a thing by outside hiring; in fact, both would have been better off if each had promoted its own person.

"I think I have the answer to the problem. First, any organization that has a senior position open should have the courtesy to notify its staff. Second, after identifying those members of the department who might qualify for the opening in question, the manager should evaluate candidates face-to-face so that they can defend their abilities and skills. Third, if a manager cannot find any qualified people on his staff, he should hire someone from outside the firm."

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## Foreign Receptivity to American DP Services

(Continued from Page 31)

Our belief that widespread sales of DP systems to certain countries can mean retardation of their industry is underscored by our recent efforts to inhibit or prevent the supply of high-tech systems to the Soviet government. Motivating the French refusal to cooperate with us in this might have been their realization that such a ploy was likely to work, from which it would follow that were we fickle Americans inclined, for whatever reasons, to apply similar sanctions to them at a later date, it could be quite harmful to their interests.

It's difficult, if not impossible, to find a single foreign government that is not increasing its control of data processing through its PTT except for those in profoundly underdeveloped countries. The swiftly changing nature of today's computer systems technology and its means of delivery has, thus, not gone unnoticed abroad. It provides each country with new means to reduce purchases of "foreign" (mostly American) computer power, reduce the cost of such purchases by neutralizing the issue of product manufacture identity and revive its prior, local sources.

It also prepares the way for the emergence of massive integrated systems digital networks (ISDN), from which may flow the powers of data processing with economies of scale as great as those we already enjoy in our telephone service or electrical power.

Among the many ISDN embryos in America today are American Bell, Inc.'s Advanced Information Systems/Nef 1000, General Electric Information Services Co., Citicorp's Citishare and the union of IBM's Information Network with Satellite Business Systems communications. Each will give birth to massive computer systems power utilities so compelling in their versatility and cost-effectiveness that today's corporate computer facilities will be reduced to the status of terminals.

But in the U.S., our ISDN owners and operators will compete for user dollars on quality and cost. Their products and services, bundled or unbundled, will provide users with an alternative to obtaining their own hardware, personnel, software, maintenance and so on.

Configuring themselves into massive service bureaus, our ISDNs could ultimately eliminate the need for the possession by large and small corporations of their own DP centers. Using local-

area networks controlled by digital private automatic branch exchanges, data processing power will be obtainable from supercenter systems and distributed to terminals virtually everywhere. This phenomenon will continue to foster innovation as each ISDN is enhanced with powers not to be otherwise obtained.

Abroad, ISDN roles (in the near term) will vary in

their impact on corporate facilities. While Japan is paralleling the American model (with the exception that its PTT is government owned), various other countries will continue to view their communications systems as separate from computer systems. Establishing interface requirements for users of their communications facilities, and varying connect point locations, governments of

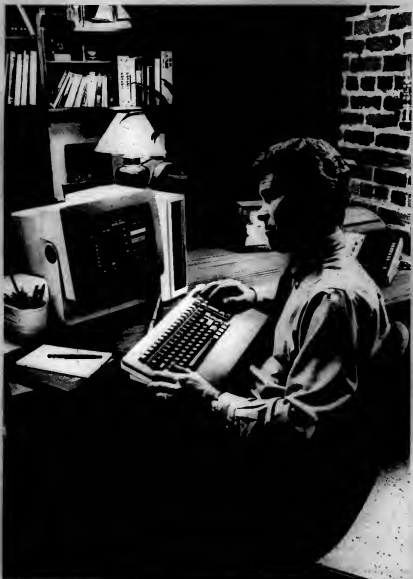
such countries will bide their time until the Japanese model is achievable. If their telephone service is poor anyway, they've no need to distribute computer power in the same way.

In all cases, governmental regulation of DP hardware and software will rise. For all countries now know that in their communications systems, they hold the key to the employment (and de-

ployment) of modern computer systems power and all that that implies.

It's ironic that as America initiated the process of deregulating its communications industry and lessened government interference in it, all other developed nations were headed in the opposite direction.

It's highly likely that any government-owned PTT will be pressured into seeking so-



# From '83 Onward: A Painful Turn of the Screw

ciopolitical solutions to technological problems at the expense of foreign suppliers. As the PTTs assume central responsibility for providing computer services, the huge variety of computing devices adorning foreign ISDNs will lose their original identities, in much the same way as equipment supporting telephone services has.

Thus, in creating and controlling a single ISDN, a foreign

government will obscure the component product identities that were so vital to equipment sales, in the past. But before many foreign ISDNs reach this stage, a myriad of tactics to favor or intimidate suppliers of DP products and services will be employed. What else could one conclude?

Competing in a government-controlled ISDN marketplace will require special

skills, including the capacity to deal with foreign governments at a more intimate level than ever before. Increased foreign PTT control of data processing through control of its communications veins, arteries and space alone will produce new challenges for the American computer systems companies. And in countries where the PTT provides competitive products and

services, these challenges will be the most difficult to overcome.

In Japan, competition by foreign companies will be most difficult of all. Japan possesses its own computer systems development and usage skills and an excellent PTT, namely, Nippon Telephone and Telegraph (NTT). Japan's motivation for acquiring outside support of internal requirements will

diminish, if not evaporate.

Like America, Japan is creating a number of ISDNs. Unlike the American model, Japan's ISDNs all originate under the aegis of the government-controlled NTT.

NTT's entry into the computer services business through its own functionally identifiable ISDN systems is under way. Combining NTT systems power with that of other ISDNs operating under its umbrella, Japan is creating a massive computer services delivery system that should persuade many local businesses to rid themselves of internal DP systems installations. While this occurs gradually, Japanese development and production of computer systems technology by its high-tech giants —富士通 Ltd., Hitachi, Ltd., Nippon Electric Co. and so on — could virtually eliminate outside purchase requirements.

That some needs will continue to be met through recourse to external suppliers is, however, inevitable. For trade outside the high-tech area cannot be so reduced as to obviate the need for good and intelligently balanced international relationships. And in the mix of things, establishment and/or reinforcement of such relationships may impel the Japanese government to slow down its own home-grown computerization.

The Japanese model is the one toward which the rest of the world, excluding the U.S., will move. To the degree that indigenous high-tech industries prove capable of fulfilling internal needs, this goal will be attained. Thus, countries like Belgium have little hope of self-sufficiency in computer technology for the foreseeable future. The same holds true of Venezuela, Canada, Austria, Austria, Mexico, Brazil and Hong Kong. Italy could be self-sufficient, but internal dissension (as usual) prevents this. Those with the best chance of succeeding are France, West Germany, the UK and Sweden, Australia and U.S. business opportunities for high-tech export to Japan will be lost to the last.

What seems certain is that Americans purveying their high-tech wares abroad will soon find themselves facing European Economic Community-like cartels of local industries, which will be nestled under the protective wings of government PTTs without whose approval sales will be impossible.

*Leicht is president of Leicht, Steinberg, Inc., a New York-based think tank specializing in computer and communications technologies.*

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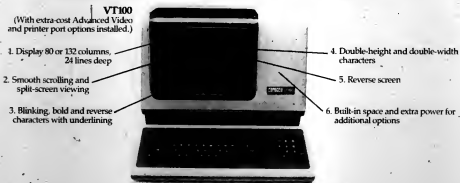
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## Software AG Adds Graphics To 'Natural' System

RESTON, Va. — A graphics capability for its Natural on-line application development system has been introduced by Software AG of North America, Inc.

Natural/Graphics reportedly allows users to retrieve data from a Software AG Adabas data base using standard Natural commands. Additional commands are provided by the package to describe the desired graphic presentation of the output. Data records and command information are then passed to specialized graphics software packages that actually create the graphics output, the vendor noted.

The initial implementation of Natural/Graphics supports IBM's Graphic Data Display Manager (GDDM) and Presentation Graphics Feature (PGF) program products. Natural/Graphics is said to run under any teleprocessing monitor or operating system that supports GDDM/PGF. This includes IBM's CICS, TSO, CMS and Software AG's Com-Plex running under IBM's OS/VS1, MVS, DOS/VSE and VM/370 operating systems.

Natural/Graphics may be purchased for \$15,000. Various lease plans are available, the vendor said from 11800 Sunrise Valley Drive, Reston, Va. 22091.

## Monitoring System Spells Real-Time Relief for Bank



Bill Turner

PORTLAND, Ore. — Keeping its DP system efficient used to consist of days or weeks of trial and error in tuning attempts and fire-fighting programs for U.S. National Bank of Oregon here.

Because it is the largest bank in Oregon

and handles over 500,000 checking and savings accounts and over 400,000 credit card holders, this process was not only costly and time-consuming, but also totally unacceptable for the firm. Bill Turner, assistant vice-president and manager of the technical services department of the bank, explained, "One of my commitments is to improve the performance of the system, not just one time or whenever we are in trouble, but as a continuous task. I've assigned this as a primary responsibility for one of the systems programmers."

The DP division has made a commitment to performance tuning via its systems programming department. Therefore, it became necessary to find a product to give a detailed look at the inside of the system, pinpointing existing bottlenecks to performance.

The data center often had problems with jobs holding data sets, according to Turner. The programmers never knew which particular data set or what other jobs were waiting in conjunction with the job. The only indication of the problem

(Continued on Page 40)

### Simplifies Query Functions

## Intel Enhances System 2000

AUSTIN, Texas — Intel Corp. has announced that Release 11 of its System 2000 data base management system includes relational data base access functions to simplify the query capabilities of the product for end users, access to multiple data bases, data base modeling and prototyping and decision assist for "what if" data bases.

In an on-line environment, System 2000 Release 11 offers a new teleprocessing interface for IBM TSO and CMS environments. The interface is said to combine the strong points of the existing batch and TP interfaces. For example, user files such as Data, Command, Report and Message are no longer required to be in a particular virtual machine or region. Users can designate file locations through a new syntax called Local File. Additionally, the new interface has performance improvements such as resource release between TP segments and 4K bytes transfer blocks to the

user region to improve transaction throughput, the vendor said. Release 11

(Continued on Page 38)

## 'Execucalc' Update Targets GDDM

NEW YORK — Parallax Systems, Inc. has announced that its IBM VM/CMS based electronic spreadsheet package, Execucalc, now runs with IBM's Graphic Data Display Manager (GDDM) product.

According to the vendor, the GDDM interface was developed in response to the popularity of this product in the information center environment and as a first step toward the development of a color graphic capability for Execucalc.

A perpetual license for Execucalc is available for \$5,000 per CPU from Parallax at 331 W. 71st St., New York, N.Y. 10023.

## MVS/TSO Added To T/S Service

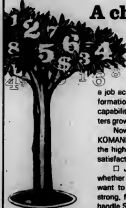
MARINA DEL REY, Calif. — Budget Time-Share, Inc. has announced the addition of IBM's MVS/TSO operating system as part of its time-sharing service.

MVS/TSO is offered as an alternative to VM/CMS and permits interactive time-sharing operations to run concurrently with teleprocessing and batch processing services on systems not originally intended for time-sharing purposes, the spokesman said.

The SAS Institute, Inc. family of statistical analysis, econometrics and graphics packages will be available for both operating systems, the spokesman added.

The company is located at 4739 Alla Road, Marina Del Rey, Calif. 90291.

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## DG/3275 Announced Emulation Package Fits IBM

WESTBORO, Mass. — Data General Corp. has announced a software emulation package for accessing IBM systems.

Called DG/3275, the product is designed to permit DG Micronova, Nova, Commercial Systems, Microclipse and Eclipse computers to access an IBM host computer by emulating an IBM 3275 display station, a spokesman said.

Communication is reportedly accomplished through IBM's Binary Synchronous Communications Protocol.

The DG/3275 is available in two versions: one for the MP/OS and one for the Rdos and Icos operating systems.

The package can be used with either a dial-up or dedicated connection, the spokesman added.

The initial license fee is \$2,500. Subsequent licenses are available

## System 2000 Gets Update

(Continued from Page 37)  
 also has increased the allowed number of concurrent end user tasks from nine to 230.

For the IBM VM/CMS on-line environment, Release 11 offers several enhancements beyond the TP interface, the vendor continued. These include the addition of a new 4K byte block size to the list of allowable data base and scratch file block sizes. This feature is said to permit users to take advantage of improvements in I/O performance provided by recent enhancements to the VM/CMS environment for fixed block architecture devices. Other Release 11 enhancements are intended to improve data integrity by updating CMS directories more quickly.

System 2000 Release 11 is said to support an IBM Structured Query Language (SQL) type access to one or more System 2000 data bases. By using a new verb, Collect, users can create subsets of portions of one or several data bases. Called collect files, these contain data extracted from the original data bases. They are relational tables, the vendor explained, which may be treated as temporary data bases or used to create another System 2000 data base. Users can employ the Self-Contained Facility Report Writer language and its conversational interface, Genius, to create both column-style reports and a variety of graphics.

The basic Report Writer language has been enhanced with relational data base access facilities and Genius has had graphics capabilities added for the TSO and CMS environments, the vendor added.

System 2000 Release 11 will be available for IBM-based OS and VM/CMS environments the second half of 1983. The conversational Report Writer capability, including graphics, is currently available. The price of the basic System 2000 Release 11 software is \$70,000. The Report Writer option is priced at \$35,000. Intel is located at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

from the firm at \$1,250 from 4400 Computer Drive, Westboro, Mass. 01580.

## IBM Users Get Report Manager

BIRMINGHAM, Ala. — Mantissa Corp. has announced Release 7.1 of its Report Management System software for users of IBM DOS/VS, DOS/VSE, OS/VS1 and OS/MVS.

A new keyword facility provides commands that allow construction of English-like sentences to define report requirements. Extended selection criteria provided in the Select Command, along with additional information provided by the Report Manifest, ties the individual Sysout data sets processed back to the originating job numbers and names.

The spokesman said the OS/VS external writer performance has been increased by 30%. Other new features include Sysout selection by output class and/or destination and native support for all announced direct-access storage devices.

The MVS version costs \$19,000 until April 15 and \$21,000 thereafter. The DOS product costs \$10,000.

The maintenance fee for either system is 12% until April 15, 14% thereafter from Suite 200, 244 Goodwin Crest Drive, Birmingham, Ala. 35209.

## Bimp3270 Copies Screen Images To Printers

MINNEAPOLIS — B I Moyle Associates, Inc. has announced a CRT screen print facility for IBM DOS/VSE and CICS/VS users.

Bimp3270 may be used to copy screen images to terminal printers or to system printers or to route output from on-line application programs to terminal printers, a spokesman said. The product can be used to provide hard copy of specific screens in production application situations, for documenting application use problems and for generating sample screen images for application documentation.

The package costs \$720, or \$360/year on a lease basis from B I Moyle at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

## Hospital Unveils System/34 Interface

— GLEN DALE, W. Va. — Reynolds Memorial Hospital has announced the availability of its IBM System/34-compatible Gencon34, said to control the sequencing of generations from diskette backups.

The software reportedly helps eliminate operator backup and retrieval errors and is completely documented.

Gencon34 costs \$95 from Reynolds Memorial, located at 800 Wheeling Ave., Glen Dale, W. Va. 26038.



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## JCF Introduced by Xerox

EL SEGUNDO, Calif. — Xerox Corp. has introduced a Job Control Facility (JCF) said to provide IBM users with direct access to features offered by the Xerox 9700 and 8700 electronic printing systems.

Using IBM's MVS/JES 2 operating system, users can reportedly call up Xerox laser printing features through the use of IBM's JCL software, according to a Xerox spokesman.

## MVS Users Get 'Bdam Fast Path'

SALT LAKE CITY, Utah — Utility Software Co. has announced Bdam Fast Path, for users of IBM's MVS operating system.

The package reportedly offers between 30% and 80% performance improvement over IBM's Bdam and Vsam access methods.

man. JCF is said to enable IBM JCL to initiate such features as two-sided printing, page formatting and electronic forms and fonts usage. JCF costs \$14,000 plus monthly maintenance of \$200, according to the vendor.

Xerox's Printing Systems Group is located at 880 Apollo St., El Segundo, Calif. 90245.

The package is supported on IBM 370 and compatible mainframes using MVS Release 3.8 or MVS/SP operating systems, according to a vendor spokesman. Bdam Fast Path costs \$2,000, the vendor said from 2140 Qualitone Drive, Salt Lake City, Utah 84118.

## McAuto 'Co-op' Version Out

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has introduced a low-cost version of its distribution system software.

Offered as part of its Customer

On-Line Order Processing (Co-op) family, the new version is a fully integrated system said to permit automatic of entire order processing cycles from customer order to receipt of payment.

Co-op clients may process on McAuto computers on a time-sharing basis or install the software on their own IBM 4300 series or larger machines. The version uses IBM's DL/I data base management system and OS and CICS operating environments. Base price is \$150,000 from the firm in St. Louis, Mo. 63166.

## IBM Micro Users Get Graphics Aid

SAN DIEGO — Integrated Software Systems Corp. (Isco) has announced a software package that is said to enable the IBM Personal Computer to function as a graphics terminal. The software also provides a slide projector capability for storing completed graphics for later viewing, the company said.

The package includes a device driver for a mainframe, mini or 32-bit micro host computer on which Isco's Tell-A-Graf or Displa graphics software is installed and a floppy disk graphics link for the Personal Computer. Graphics can be produced on any of more than 135 output devices, the company said.

The package can also be interfaced with the company's Cuechart user-prompting system and the Data Connection software family. The initial price of the host computer device driver is \$2,000. Encoded floppy disks cost \$245 each. The Personal Computer requires a serial communications adapter, a color graphics adapter and a monitor.

The company is located at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

## 'Espul' Announced For HP 3000 Users

SALEM, Ore. — Data Information Science Center, Inc. has announced a utility program for the Hewlett-Packard Co. HP 3000 said to allow greater flexibility in managing output spoolfiles than is available under HP's Multiprogramming Executive.

Extended Spool Utility (Espul) reportedly allows users to alter or purge spoolfiles by spoolfile identification, user, job/session and file name. Espul costs \$750, according to the vendor. Additional information is available from Data Information Science Center, P.O. Box 3185, Salem, Ore. 97302.

## Backup and Restore Facility Out for DOS/VSE Users

MINNEAPOLIS — Davis, Thomas & Associates, Inc. has announced a Vsam backup and restore utility for IBM DOS/VSE users.

Dtvasam is a batch utility that performs I/O at the record level, a spokesman said. The package may be used to reset any reusable data set independently from the data set load. Reusable data sets are reset automatically.

Dtvasam allows for user exits coded in assembler or Cobol. Exits are specified by file to Dtvasam in the input parameter cards at runtime. Exits may be used to delete or change records prior to output, the spokesman said, or to force the end of a data set. The package costs \$1,200 including

ing the first year of maintenance from the firm at Suite 301, 8800 Highway 7, Minneapolis, Minn. 55426.

## MSI Software Announces Aid For System/38

OSTERVILLE, Mass. — MSI Software, Inc. has announced the Accounts Payable 2000 system for the IBM System/38. The system reportedly was written in Structured RPG-III using externally defined files and designed for the more complex accounts payable environment.

The 2000 system is said to offer multicompany, multidivisional support and be closing-independent. Distributions and interfaces are provided both to general ledger and job costing. Interactive voucher entry and vendor analysis are supported for up to 99 workstations per firm.

A check reconciliation subsystem, general ledger coding subsystem, expense analysis, interactive audit sampling and tax reporting are provided. All 1099 formats are supported with 1099-type code maintenance.

The Accounts Payable 2000 system costs \$15,000 from MSI Software, 1054 Main St., Osterville, Mass. 02655.

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# Monitoring Tool Provides Real-Time Relief

(Continued from Page 37)

was a message on the operator's console to indicate which job was waiting on data sets, he explained. In addition, there were problems with inactive page data sets on the bank's IBM 3033. The only way this information was available was if someone happened to see the system discontinuous use of the page data set at the time the error occurred. This meant watching the system constantly.

To eliminate these problems, Turner suggested the purchase of Omegamon, Candle Corp.'s software monitoring system. He felt that Omegamon could monitor the system and provide systems programmers with the kind of information they needed to alleviate data set contention problems, as well as several other situations the center was experiencing.

In fact, there were additional problems that involved time and manpower. For example, the center's IBM 370/168 was down, and IBM's IMS, TSO and batch were all running on the larger IBM 3033N. Omegamon showed that Vtam was in a loop and, unfortunately, Vtam could not be canceled or forced from the operator's console. However, Omegamon was able to command Vtam to end. Without Omegamon, the problem could not have been identified and an Initial Program Load would have been necessary, resulting in 30 to 45 minutes of downtime for both IMS and TSO.

More significant was the center's "elusive problem," as they called it. No one could figure out what was happening. It turned out that the system resource manager (SRM) was swapping out jobs when the auxiliary storage manager (ASM) queue reached a certain depth. However, the depth was not severe enough to warrant this type of action. It seemed the threshold at which the SRM began to take action was set too low. Not only did this needlessly stop the jobs from running, but it also added to the problem by adding to the ASM queue depth. The SRM constants were zapped to relieve this problem and the CPU utilization immediately increased while jobs remained swapped in.

Another problem involved the SRM's limiting multiprogramming level due to paging activity. Again, this was unnecessary. The SRM constants were zapped to allow higher levels of paging. By doing a continuous performance review using Omegamon, the programmers were able to look at the SRM parameters to see where they were wrong and get immediate feedback on what was happening. As Turner described one situation, "We discovered that the SRM had been set at zero. We didn't know when that happened, or why, for that matter. This situation could have prevented page stealing and added to paging activity. Values were set to IBM defaults, but it was Omegamon that allowed us to go in to correct the

problem."

In addition, Omegamon's exception screen helped the systems programmers out of many tough situations, he recalled. There were two or three instances when a disk had dropped the ready status, a situation that was indicated by the exception screen. There were also contention problems on some jobs running on swing shift. The jobs seemed to be conflicting with each other, and it was difficult to pinpoint the place of conflict. Omegamon alerted the programmers to the contention immediately and enabled them to fix the problems on the spot.

## Greatest Advantage

Aside from the resolution of all these problems, the greatest advantage for the technical services department lies in the ability to perform real-time tuning of the system. "To be able to tune the parameters and get immediate feedback on the effect has been beneficial to us," Turner said, "especially when we added a third CPU and quite a bit of contention for direct access storage devices. I don't think we could have made it work at all without Omegamon."

In fact, the tuning of the system has been substantially improved. The parameters can be adjusted to see exactly what the effect would be—even while the system is loaded. At U.S. Bank of Oregon, tuning is an ongoing procedure. As Turner stated, "Tuning is not a project to complete and check off your list. It's a continuing process, particularly in most shops today that are very dynamic

and constantly adding applications or different hardware to their systems. New applications and hardware changes will always have an impact on any tuning already done to the system."

As for the result of all of this system tuning, it is productivity, morale and cost-effectiveness. Turner appraised a 10% to 15% increase in productivity for the entire data center.

There is an effect on the morale of the systems programmers, as well. Turner indicated that the programmers believe Omegamon gives these people better insight into the entire system. He also estimated that the software probably paid for itself within a couple months.

In the final analysis, then, greater system efficiency seems to be the route for greater data center effectiveness. The less downtime, the more productivity. Additionally, with greater productivity comes a rise in morale and cost-effectiveness.

## Job Scheduler Out for System 3

CAPE GIRARDEAU, Mo. — An automatic job scheduler for the IBM System/3 Model 150 has been announced by Data Trans-Formation, Inc.

The Cruise package reportedly allows users to schedule any batch or IBM Communications Control Program job to be run automatically at an assigned time and frequency.

The software costs \$465 from the firm through P.O. Box 1541, Cape Girardeau, Mo. 63701.

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# I.P. Sharpe Adds Data Bases to Its T/S Services

ROCHESTER, N.Y. — I.P. Sharpe Associates Ltd. has added three data bases to its worldwide collection of public time-sharing services. These are the Federal Reserve Board (weekly), the U.S. Flow of Funds (quarterly) and the United Nations Commodity Trade Statistics data base.

The Federal Reserve Board data base reportedly contains weekly banking and monetary statistics released by the

Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York. The information includes money stock measures and liquid assets, factors affecting reserves of depository institutions, assets and liabilities of large commercial banks, commercial and industrial loans by Federal Reserve district and commercial paper outstanding in the New York district.

The data base is updated weekly, one business day after the data is released.

The U.S. Flow of Funds is said to be a data base of over 3,600 time series on the sources and uses of funds in the U.S. economy for more than 50 major sectors. It provides a closed model of the entire U.S. economy by bringing the financial aspects of the economy into direct relation to data on the

nonfinancial aspects.

The United Nations Commodity Trade Statistics data base provides annual and quarterly history on international trade in 3,075 commodities and is available for 28 developed countries, covering transactions with about 265 trading partners. Commodities are classified according to the U.N.'s Standard International Trade Classification Revision 2.

There is no subscription fee for these services and no initiation fee or minimum monthly charge for use of the I.P. Sharpe time-sharing system. Users pay \$1/hour for connect time, 25 to 45 cents per CPU and 70 cent/1,000 characters transmitted or received.

I.P. Sharpe Associates' U.S. headquarters is located at 1200 First Federal Plaza, Rochester, N.Y. 14614.

## RPG Tool Unveiled

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has announced an RPG cross-reference system for the IBM System/34.

The system produces a cross-reference listing for RPG, Work Station Utility or Screen Format Generator source members in one-fourth the time of the IBM cross-reference procedure, the company claimed.

Cross-references are to the Source Entry Utility (SEU) line number rather than the compiler line number so that the cross-reference can be used with source listings produced by SEU, List Library or the compiler.

All basic cross-reference listing information is included. Operation codes may be cross-referenced at the user's option. The printed listing includes the library name, file type for all files and a flag to show all lines on which a field is defined, the company said.

The cross-reference system is priced at \$195 from Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.



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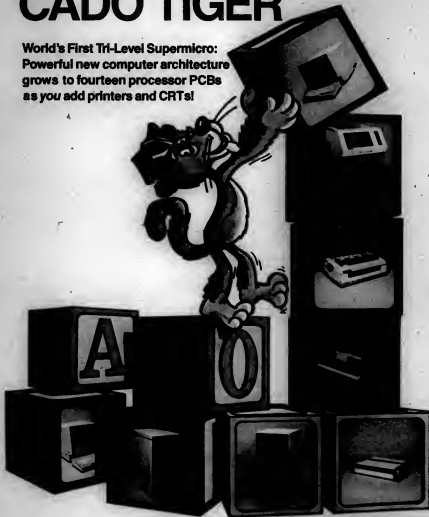
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## For Use on Wang VS Ordering System Unveiled

MONTERO, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Customer Ordering: Processing (COP), written in Wang Laboratories, Inc. VS Cobol, for use on the Wang VS system. COP requires the MCBA Wang inventory management and accounts receivable packages.

COP reportedly provides both single-customer invoicing and two-pass customer order entry with separate billing. The package checks availability and allocates inventory at entry time. COP performs on-line credit checks, provides automatic mass price change ability and supports distribution from multiple warehouse locations.

A source code license for COP is \$3,000/computer, complete with a software reference manual and a user's manual. MCBA is located at 2441 Honolulu Ave., Monterey, Calif. 91020.

## Cross System Option Out for PMO

PITTSBURGH, Pa. — Duquesne Systems, Inc. has added the Cross System Communication option to its Program Management Optimizer (PMO), said to increase efficiency in multiple CPU environments.

The Cross System Communication option reportedly operates in the computer complex where more than one CPU is running. For example,

GREENSBORO, N.C. — Gary Brown Associates, Inc. has announced a new release of its Fixed Assets Management System/On-Line for the IBM System/34 and System/38.

The package maintains asset data and offers asset accounting and prop-

erty time an update is made on PMO's managed list in one CPU, the others will automatically receive the same adjustments, eliminating problems associated with manual updates, the vendor said.

PMO costs \$5,000 and Cross System Communication costs \$1,500 from Duquesne Systems at 2 Allegheny Center, Pittsburgh, Pa. 15212.

## Asset Aid Fits System/34, 38

erty reporting, a spokesman said. Features include ability to parallel three modes of depreciation per asset: choice of nine depreciation methods; sixteen optional reports including depreciation schedules, fixed-asset ledger, asset additions, analysis of assets, inventory, work sheets and appraisal values; ability to handle multiple companies and divisions; and conversion aids.

The package costs \$2,900 for the System/34 version and \$4,200 for the System/38 version from 322-B Edwards Drive, Greensboro, N.C. 27409.

## Financial System Fits Datamaster

CHARLOTTE, N.C. — Charlotte Management Software Corp. (CMSC) has introduced a fixed-assets accounting system for the IBM System/23 Datamaster.

The package allows nine types of depreciation, as well as automatic conversion from declining to straight-line depreciation, a spokesman said. There are 11 reports available, including new, converted and retired assets, information listing, depreciation projection, register by account number, sequence number or physical location, available tax credits, tax credits taken and tax credits recapture.

A nine-time license fee costs \$750 from CMSC through P.O. Box 18646, Charlotte, N.C. 28218.

## Implementation Of Mumps Out

DEDHAM, Mass. — Datatree, Inc. has announced an implementation of the Mumps language called DT-Mumps for distributed mini systems, including Burroughs Corp.'s B-20 and NCR Corp.'s Workserver.

DT-Mumps is available for three different hardware configurations: stand-alone (one station), minicluster (two to four stations) and full cluster (five to 16 stations). Licenses are available for each category in bundled or unbundled form. DT-Mumps can also be used with the NCR Workserver and the Burroughs B-20 system when obtained as an unbundled license, although custom changes made to the operating system by other vendors may need to be integrated, the vendor said.

The implementation is said to conform to the Ansi-1977 Mumps standard, including 1982 Type A revision.

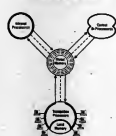
The software is designed to offer performance levels at each workstation that are comparable to those of a dedicated minicomputer, with common data bases and other system resources shared via a local-area network, the vendor said. DT-Mumps is implemented under Convergent Technologies' CT operating system.

The list price of DT-Mumps ranges from \$3,000 to \$6,000, depending on configuration. A user-only license is available for between \$1,000 and \$2,000, the vendor said through P.O. Box 1234, Dedham, Mass. 02026.

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## Programs Out for VAX-11s Under VMS

WEST NEWTON, Mass. — Cogitech has announced two products for Digital Equipment Corp.'s VAX-11 computers running under VMS.

Trouble Report Manager tracks software, documentation and design errors throughout the project life cycle, the spokesman said. Features include flexible input format with prompting, programmable report generation, prevention of accidental deletion or tampering and use of VMS mail system. The product costs \$1,500.

Configuration Manager provides control over archiving and updating of programs and documents, the spokesman said. A status log shows the date and reason for modification. Automatic reservation with exclusive locking prevents concurrent

modification of documents.

Other features include file security, trouble reports from Trouble Report Manager, report generation and electronic mail notification of updates.

## Security Package Runs on Wang VS

BROOKFIELD, Wis. — Analytics, Inc. has announced a combined program menu and operator security processor for setup and maintenance of a security system on Wang Laboratories, Inc.'s VS computers.

Called Security/Menu System, the package reportedly provides a general-purpose menu generator that dynamically generates application and program menus at runtime. The process is said to eliminate the need to compile menus for each operator and

ed material. The package costs \$1,200.

A set of both programs costs \$2,200 from Cogitech at 13 Henshaw Terr., West Newton, Mass. 02165.

to coordinate access codes in operator, data and program files.

The user defines the application system at user division, menu and program levels. Operators are linked to the application file through the assigned Security/Menu access codes. A spokesman said the package reviews operator access rights and initializes usage constants for the specified user division.

The package costs \$485 from 165 Bishop Way, Brookfield, Wis. 53005.

## Anacomp Forms CIS Users Group

INDIANAPOLIS — Anacomp, Inc. has announced that licensees of its Continuous Integrated System (CIS) have formed a users group that will guide future system enhancements. Richard Weiss, first vice-president of First Wisconsin National Bank of Milwaukee, was elected president, a spokesman said.

CIS is a retail banking software system that includes two major modules — delivery and customer. The delivery module can be used to establish a single system to process and control all existing transactions, the spokesman said. The customer module includes customer geographics and demographics, as well as an office call facility, customer individual Retirement Account reporting, complete customer risk analysis and financial statement reporting, the vendor spokesman said.

Anacomp can be contacted at 11550 N. Meridian St., P.O. Box 40888, Indianapolis, Ind. 46240.

## VAX Users Get Payroll System

AUSTIN, Texas — Standard Business Systems, Inc. has announced the Interactive Payroll System (IPR) for users of Digital Equipment Corp. VAX and Decsystem 20 computers.

IPR is a menu-driven package that includes an interface to most general ledger systems, a spokesman said. The package can handle up to a million employees, including job sharing and multiple jobs by an employee. The package produces more than 40 reports associated with bi-weekly, monthly and demand payrolls on tape, microfiche and hard copy, according to a vendor spokesman.

The package is priced at \$20,000 from One Hidden Cove, Austin, Texas 78746.

## Analysis Tool Fits System/38

SHREWSBURY, Mass. — Trisys, Inc. has announced the addition of the Control Language Analysis program, said to eliminate the error-prone task of updating by hand, to its series of IBM System/38 conversion and operation tools.

The program reportedly performs a complete analysis of the installation's control language and creates a series of reports that show the relationships among the files, programs and procedures in the applications software and between applications software and the IBM utilities, according to a vendor spokesman.

The reports show where all files are created, used and updated; when events occur in a job stream; and where and when control language programs call other control language, RPG and Cobol programs, the vendor said.

The license fee for the Control Language Analysis program is \$750. More information is available from Trisys, which can be reached through P.O. Box 274, Shrewsbury, Mass. 01545.

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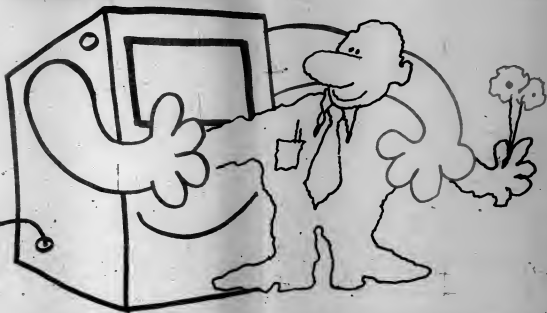
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Microtek, Inc. has announced additional driver software for its IBM Personal Computer. The software allows the Hal board to be used as a random-access memory board, a printer spooler and a disk emulator, the vendor said. The vendor said disc counts are available with the purchase of the Hal board. The vendor is located at 8014 Chesapeake Drive, San Diego, Calif. 92123.

Professional Software, Inc. has announced three adjunct software packages for its Wordpro word processing packages for the Commodore Business Machines, Inc. processors. The Administrator is a data base management package for the Commodore 8032 microcomputer, which includes multilevel sorts, mathematical functions between numerical data and searches. It costs \$595. InfoPro is an information management package for the Commodore 8000 and 8008 series processors designed to enable users to manipulate large amounts of information and print user-defined reports. It costs \$295. Wordpro Mail List is designed for mailing list applications. It costs \$150. The vendor is located at 51 Fremont St., Needham, Mass. 02194.

Relational Systems, Inc. has announced PC/Help, a Help facility for the IBM Personal Computer. The package can deliver information about various commands available under the PC/DOC operating system. It costs \$29.95. The vendor said from Suite 103, 5857 S. Genesee, Houston, Texas 77036.

A.D. Software, Inc. has announced a line of programs that translate existing Intel Corp. 8080 or Zilog, Inc. 280 microprocessor assembly language programs to Zilog's Z8000 line of 16-bit processors. There are three programs in all: a Z80 to Z8000 translator, an 8080 to Z8000 translator and a Z8000 to relocating Macro-Cross Assembler. All three are sold as a package for \$179.50. The vendor said from Suite 100, 2950 S. Jamaica Court, Aurora, Colo. 80014.

Ombot Corp. has announced a specialized version of its Softbal II language package for the Digital Equipment Corp. VT-180 microcomputer. The package allows business applications to be written in DEC's commercial language, Dblol. The Softbal II

package costs \$395. The vendor also announced that it has cut prices on components of its Softbol language system by up to 50%. The Digital Research, Inc. CP/M version now costs \$750 for the compiler and \$40 for the runtime system. The Bell Laboratories Unix version costs \$3,500 for the compiler, bundled with 100 runtime licenses and additional runtime licenses priced at \$400 for 10. Ombot is located at 212 Bacon St., Waltham, Mass. 02154.

Boardswre Executive Software has released a utility program called Wind/X that performs screen clearing maneuvers on IBM Personal Computers. It is available for \$40 from the vendor at Suite 260, Airport Park Plaza, 253 N. 121 Circle Road, Palm Springs, Calif. 92262.

International Software Enterprises, Inc. (ISE) announced the availability of multivuser versions of Micro Data Base Systems, Inc.'s MD88 III data base management system that it markets for 16-bit microcomputers running under Digital Research, Inc.'s MP/M. Microsoft Corp.'s 8086 Xenix and Bell Laboratories Unix operating systems. Pricing starts at \$2,250. ISE said from 250 W. Sagamore Pkwy., West Lafayette, Ind. 47906.

Bauer Technology, Inc. has announced a graphics package called Locus for microcomputers running under the Digital Research, Inc. CP/M-86 operating system. This package costs \$2,000. It is said from 7 Oak Park, Bedford, Mass. 01730.

Hewlett-Packard Co.'s HP Series 200 Model 16 microcomputer now offers Contest MBA, an integrated management software program, for \$795. Further details can be obtained from the vendor at 3000 Hanover St., Palo Alto, Calif. 94304.

Synergistic Software, Inc. has released a utility called Basic Programming Tools for the IBM Personal Computer. The software needs PC DOS, 64K bytes of memory and one disk drive. It costs \$120 from the firm at 830 N. Riverside Drive, Renton, Wash. 98055.

Interactive Systems Corp. has announced a family of Bell Laboratories Unix-based software

## Micro Notes

products designed to increase productivity in software development and documentation efforts. Prices for the Advanced Productivity System range from \$11,800 to \$47,500 from 1212 Seventh St., Santa Monica, Calif. 90401.

Digital Research, Inc. has announced a version of its 16-bit CP/M-86 operating system for the IBM Personal Computer priced at \$60. The vendor can be reached through P.O. Box 579, 160 Central Ave., Pacific Grove, Calif. 93950.

Also from Digital Research is a 16-bit version of the Chasic compiler (C86) said to run on any system operating under several Digital Research 16-bit operating systems, including CP/M-86, C86 and Concurrent CP/M-86. C86 costs \$600. CP/M-86 C86 costs \$600. CP/M-86 C86 costs \$600. CP/M-86 C86 costs \$600.

Datapro, Inc. has announced the Datacalc financial planning and analysis software package for Wang Laboratories, Inc. 2200 series computers. The \$1,500 package is available from Suite 502, 16400 Southcenter Pkwy., Seattle, Wash. 98188.

Microsoft Corp. has announced that its Xenix multi-user operating system will be the standard operating system on Radio Shack's TRS-80 Model 16 microcomputer equipped with 256K bytes of memory and hard disk. Up to three users can operate programs simultaneously with Xenix. All applications software currently offered by Radio Shack can be moved to Xenix. The package will be available from Radio Shack dealers.

Doystar Systems, Inc. has announced Ultrafast, a flexible, disk random-access memory emulator for the IBM Personal Computer. The package allows a portion of the computer memory to emulate up to four flexible disk drives. The product is free with the purchase of a 512K-byte Ultramem memory board at \$995 or separately for \$395 from Suite L, 10511 Church Road, Dallas, Texas 75238.

Roklan Corp. has released Autogrammar, an automatic program generation tool that is said to require no knowledge of

programming languages. The package runs on the Radio Shack TRS-80 Model II microcomputer and costs \$300 from Roklan at 3335 N. Arlington Heights Road, Arlington Heights, Ill. 60004.

Roklan Corp. also announced two programming utilities for the Atari, Inc. 400/800 home computer. Aide is the Absolute Disk Editor for data management. Telecom offers communications with a variety of other computers. Aide costs \$30. Telecom costs \$70 from 3335 N. Arlington Heights Road, Arlington Heights, Ill. 60004.

Howard W. Sams & Co. has announced software for the Ap-

ple Computer Corp. Apple II or Apple II+ computer. Pretty Darn Quick is a data handler of editing, editing features and search and retrieve. It costs \$40. Money Trees is a home or small business financial record keeping and reporting system. It costs \$60. All packages are available from 4300 W. 62nd St., P.O. Box 7092, Indianapolis, Ind. 46236.

United Microwave Industries, Inc. has announced Wordcraft 20, a word processing package for personal computers. Wordcraft Business Machines, Inc. VIC-20 microcomputers. The package comes with a permanent read-only memory cartridge, which allows the user to create documents, letters and personalized form letters. The

(Continued on Page 58)

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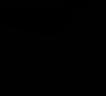




Choropleth Map of Population

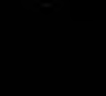


Pie Chart of Revenue



Bar Chart of Sales

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SAS Pty. Ltd., Level 60, MLC Centre, 11-29 Market Place, GPO Box 4143, Sydney, NSW 2001, Australia. Phone 021 231-2100. Telex 4347449.



## Financial Modeling Package Targets Users of Wang VS

SEATTLE — Minicomputer Modeling, Inc. has announced Data\*Model/B, a financial modeling package for users of Wang Laboratories, Inc. VS, Office Information Systems and 2200 series processors.

Data\*Model/B was designed for users who do not require the consolidation and external file interface capabilities of the firm's Data\*Model package. Data\*Model/B can produce interactive models using menus.

Model results can be integrated into word processing systems. Models can be very large — up to 30,000 rows and 500 columns — and the package includes built-in data projection, financial and goal-seeking routines, the vendor said.

Data\*Model/B costs from \$1,200, the vendor said from

Suite 508, Queen Anne Sq., 200 W. Mercer, Seattle, Wash. 98119.

## File Utility Out for HP 3000

SANTA CLARA, Calif. — Goldin Software Systems, Inc. has announced a file compression utility for users of Hewlett-Packard Co.'s HP 3000 minicomputers using HP's MPE III and MPE IV operating systems.

Compress/3000 reportedly can cut the amount of disk space used by 50% to 75%.

It costs \$750/CPU from 609 Meadow Ave., Santa Clara, Calif. 95051.

The packages include FCS-EPS from Evaluation and Planning Systems, Inc., SPSS, Inc.'s Conversational Statistical System (SCSS) and Box-Jenkins from I.P. Sharpe Associates Ltd.

Under the independent software vendor agreement, the vendors sell and support their own software products, the spokesman said.

The prices range from \$2,000 to \$48,000 from DG at 4400 Computer Drive, Westboro, Mass. 01581.

tabulation, queries about a file and general data management.

Box-Jenkins is an analytical tool for forecasting time series data.

Under the independent software vendor agreement, the vendors sell and support their own software products, the spokesman said.

The prices range from \$2,000 to \$48,000 from DG at 4400 Computer Drive, Westboro, Mass. 01581.

## 'Costrol' Unveiled

COLONIA, N.J. — Computer Cost Control Corp. has unveiled a software package for the IBM System/34 designed to provide resource control for fleet and transportation management.

Control manages key maintenance resources, including equipment, labor, energy, parts, fuel, drivers and facilities.

It features recordkeeping of those key resources and reportedly generates reports that provide information and analyses for fleet management and cost control, the vendor explained.

Batch processing and time-shared on-line service using the Control system is available, the vendor said.

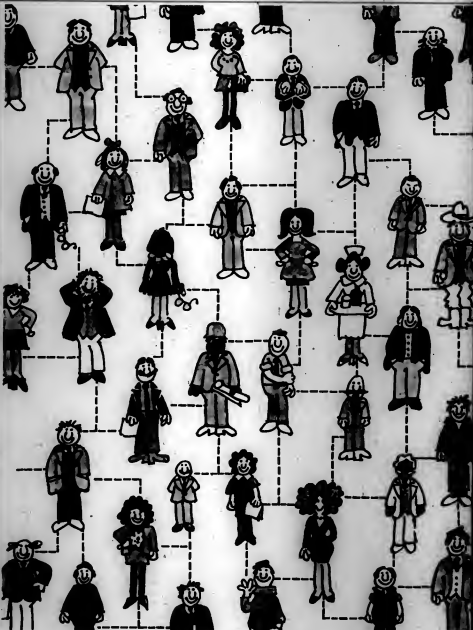
The license for the System/34 configuration is \$17,500; the System/38 version, scheduled for release in June, costs \$27,500.

Computer Cost Control is located at 805 Inman Ave., Colonia, N.J. 07067.

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## Report Generator Unveiled For Hewlett-Packard 3000

TAMPA, Fla. — Collier-Jackson, Inc. has released CJ/Advanced General Ledger, a report generator for the Hewlett-Packard Co. HP 3000 computer.

The system reportedly handles reorganization, consolidations and new products and projects. Users can define and produce reports at any level of the organizational structure and assume

control of the contents and appearance of reports via a financial report writer.

On-line inquiry provides access to financial status of the organization, groups, departments or accounts, the company claimed.

A license fee, including a two-day management training class, costs \$18,000 from 5406 Hoover Blvd., Tampa, Fla. 33614.

## Stratus Package Reads Ticker Tape

NATICK, Mass. — Stratus Computer, Inc. has announced a software package for its Stratus/32 Continuous Processing System that allows applications to read ticker tape lines supplying stock, bond and option trading information.

The Stratus Financial Ticker Protocol Support (FTPS) reads data provided by any of the financial trading services that use the binary synchronous broadcast

ticker protocol, a spokesman said. FTPS provides data transmission checking, blocking, code conversion

and error detection.

A system license costs \$5,000 from 17 Strathmore Road, Natick, Mass. 01760.

## Data Acquisition Module Serves DAS 9100 Users

BEAVERTON, Ore. — The Design Automation Division of Tektronix, Inc. has announced the 91A24 Data Acquisition Module for its Dig-

ital Analysis System (DAS) 9100. Targeted for real-time analysis of software operation during development and integration, the 91A24 reportedly helps the user track complex software flow and selectively store data.

Coupled with the extended Define Memory feature of the DAS, the 91A24 provides the user with a tool for support of proprietary microcomputer designs and system analysis, the vendor said.

The DAS 91A24 Data Acquisition Module is priced at \$5,500 from the vendor through P.O. Box 1700, Beaverton, Ore. 97075.

## Net Customers Get Graphics For Business

CINCINNATI — Imagematrix, Inc. has announced that it will provide a computer-generated business graphics service to customers of Compuserve, Inc.'s information network.

The graphics service, called Quick 'N Quality, allows users to create data for 35mm business slides or overhead transparencies, the vendor said.

The service costs \$8 to \$25 for slides and \$20 to \$37.50 for transparencies. Prices vary according to the complexity of the graphics, the vendor said from Suite 400, 120 E. Fourth St., Cincinnati, Ohio 45202.

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(Continued from Page 46)  
package costs \$270, the vendor said from 3503 Pomona, Calif. 91768.

Data Transport, Inc. has announced PC Create, a program generator for IBM Personal Computers and Apple Computers, Inc. Apple II systems. The package offers structured source code in Basic and allows users to add their own application modules. The package costs \$50, the vendor said from 347 E. 62nd St., New York, N.Y. 10021.

Micromin, Inc. has announced the Relational Information Management (RIM) data base for the IBM Personal Computer. RIM reportedly can be transported between many types of computers in a network environment and runs under Microsoft, Inc.'s MS/DOS operating system. The price is \$795 from P.O. Box 585, 555 116th Ave. N.E., Bellevue, Wash. 98009.

North American Technology, Inc. has announced the Unity

relational data base management system. The Bell Laboratories Unix-based software is designed for 16-bit microcomputers and costs \$2,995 from the vendor at 9570 S.W. Harbor Blvd., Portland, Ore. 97219.

Cyberfile DBMS offers interactive application development and data access. Digital Research, Inc.'s CP/M-based and Microsoft, Inc.'s MS-DOS-based microcomputers. This software is available for \$1,200 from Cyberfile Data Systems Corp., 31225 La Brea, No. 118, Westlake Village, Calif. 91362.

I.P. Sharp Associates Ltd. has released Micromagic for VisiCorp VisiCalc formatting on the IBM Personal Computer. It costs \$150, the vendor said from Suite 1900, 2 First Canada Place, Toronto, Ont., Canada, M5X 1E3.

Infoshare is a communications package from The Information People that runs under either Digital Research, Inc.'s CP/M or MP/M operating software. It costs \$250, the vendor said from 443 Hudson Ave., Newark, Ohio 43055.

Zilog, Inc.'s Z8000 microprocessor now offers an option called Mimix that reportedly permits it to run both Bell Laboratories Unix-based and Digital Research, Inc. CP/M-based software programs. This option is priced at \$1,000, the vendor said from 1313 Bell Ave., Campbell, Calif. 95008.

Unisoft Systems Corp. has announced a version of Bell Laboratories Unix operating system software for the Apple Computer, Inc. Lisa personal computer. Unisoft costs \$750, the vendor said from 2405 Fourth St., Berkeley, Calif. 94710.

Science Management Corp. (SMC) has announced that its SMC Business Basic interpreter is available for Apple Computer, Inc.'s Lisa microcomputer.

SMC Basic is compatible with Microsoft Corp.'s Xenix operating system and was designed to work in conjunction with accounting software developed by Open Systems, Inc. SMC said. The suggested retail price for SMC Business Basic is \$395 and is marketed through Open Systems, Inc. at 430 Oak Grove, Minneapolis, Minn. 55403.

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## Connects DPS 6 to IBM Network

## Honeywell Introduces SNA Release 1.1

WALTHAM, Mass. — Honeywell, Inc. has introduced an enhanced version of its software package designed to connect the Honeywell DPS 6 to an IBM Systems Network Architecture (SNA) network. The level of compatibility is said to permit concurrent use of IBM's Binary Synchronous Communication (BSC), SNA and Honeywell networking protocols for both interactive and batch processing, while providing local office automation, transaction processing, data entry, program development and other functions.

The enhancement, called SNA Release 1.1, includes the addition of an SNA file transmission facility and simplification of Honeywell's existing SNA interactive and SNA remote job entry (RJE) facilities, a vendor spokesman said. The SNA file transmission facility allows the user to exchange large volumes of data and control information and programs between IBM host processors and DPS 6 minicomputers.

The enhanced Honeywell SNA facility

## Intersil Option Out For 8270 System

SUNNYVALE, Calif. — Intersil Systems, Inc. has released the Information Processing Option (IPO) for its 8270 Information Display System, described by the vendor as a package solution to users needing the function and reliability of IBM 3270 series equipment with more flexibility for expansion.

IPO is said to provide the IBM mainframe user with the ability to process data locally at an IBM 3270-type CRT terminal while still using the large host computer for other tasks.

The basic IPO unit comes with 1M byte of unformatted floppy disk storage, printer and Winchester disk interfaces and connects to the 8278-2 display station. With the IPO, the user reportedly receives a standard software package: Digital Research, Inc.'s CP/M; Microsoft, Inc.'s Basic-40 Interpreter; Perfect Software's Perfect Writer word processor, Perfect Speller spelling checker, Perfect Filer file management and Perfect Calc spreadsheet analyzer. Optional software packages include Microsoft's Macro-80 macro assembler, Basic compiler, Fortran-80, Cobol and Digital Research's Pascal MT+.

The price of a basic system, consisting of a 8278-2 terminal, IPO processing unit and standard software package, is under \$3,500. Intersil Systems is located at 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

will be available in May. The host program product annual license fee is \$2,435 and the DPS 6 program product annual, primary license fee is \$75. The annual primary license fee for the enhanced SNA in-

teractive facility is \$235, \$355 for the enhanced RJE facility and \$290 for SNA transport — an existing prerequisite for all Honeywell SNA products.

(Continued on Page 52)

## Northern Telecom Adds Model Of Displayphone for SL-1 PBX

NASHVILLE, Tenn. — Northern Telecom, Inc. has taken the wraps off a new model of its Displayphone that is designed specifically for use with the firm's SL-1 private branch exchange (PBX).

The SL-1 Displayphone is an integrated voice and data terminal that reportedly combines features of the SL-1 telephone with those of the Displayphone. It allows managers, professionals and other knowledge workers to use computerized information resources and electronic mail systems by means of a video screen and keyboard, according to a vendor spokesman.

It includes a 7-in. video screen, retractable keyboard and a telephone handset for voice communications. A conversation can take place while information appears on the screen.

It provides simultaneous voice and data communications and offers a message-waiting indicator, conferencing and ring-back, which notifies the user when a busy extension is free, the spokesman said. The SL-1 Displayphone can communicate with terminals connected to other asynchronous SL-1 data interface devices.

Data calls can be dialed automatically (Continued on Page 58)

## Acces Add-On Compatible With Ethernet Controllers

SOQUEL, Calif. — Associated Computer Consultants (ACC) has released an addition to its ACC Exchange System (Acces) — the Network Systems (NS) Protocol Package said to be compatible with many Ethernet controllers, including ACC's programmable Ethernet controller, IF-111 Ethernet.

The NS Protocol Package reportedly implements the Xerox Corp. Network Systems protocols in a strictly layered manner, offering the application programmer the ability to name, locate and utilize high-level processing services in a distributed environment.

Package features include support of Digital Equipment Corp. PDP-11 or VAX-11 and Bell Laboratories Unix, RSX or VMS operating systems; implementation through Level 3 of the Xerox Network Systems Protocols (OSI layer 6); C language interface at multiple levels of the NS protocol; as well as multiple user access.

Two versions of the NS package are offered. The first, NU-11/NS, is a host-resident package, which reportedly imple-

ments the NS Protocol Package through the Courier level (OSI model layer 6). All (Continued on Page 58)

## Amdahl Unveils Series of TDMs

SUNNYVALE, Calif. — Amdahl Corp. has announced a series of time division multiplexers said to concentrate up to 96 channels of data over a single, high-speed trunk facility.

The microprocessor-based 2211 series reportedly provides network management and monitoring capabilities that permit on-line reconfiguration, alarm monitoring and system diagnostics at one location.

The series offers the user the ability to multiplex different types and mixes of synchronous and asynchronous data from a variety of information resources.

The series price ranges from under \$10,000 to \$50,000, depending on configuration from Amdahl, 1250 E. Arques Ave., P.O. Box 470, Sunnyvale, Calif. 94086.

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## For Datavox Deskset

## Cluster Controller Announced

MERRIMACK, N.H. — Datavox Communications Corp. has released a modular cluster controller for its Executive/Professional Deskset.

The Model 3270 is a single, eight-port device that reportedly can:

- Function as a single IBM 3274-51C replacement cluster controller, for use with Datavox Desksets.

- Function as a coaxial cable eliminator, permitting up to seven IBM 3270-type devices to share a single cable with no degradation of performance. This feature can

result in a reduction by as much as 84% of the long cable runs normally required. It is also said to permit individual terminals and printers to be located as far as 10,000 feet from the controller.

- In combination with other Datavox controllers, function as a 3274-21C or 3274-31C replacement controller, for support of up to 32 terminals and printers.

The principal advantage of this product is the level of user flexibility. The modular design reportedly also reduces terminal downtime.

With software, the Model 3270 Cluster Controller costs \$3,800 from the vendor, 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

## Controller Fits DDD Net

SAN JOSE, Calif. — Backus Data Systems, Inc. has introduced a combination modem/error controller said to feature autodial capability for direct distance dialing (DDD) fallback.

The Data Integrity System provides for transmission of asynchronous or synchronous data over either leased lines or AT&T's DDD network. The intelligent error controllers are offered in a variety of configurations, ranging from a two-port dial-up system with included 1,200 bit/sec modem, to a six-port network control station designed to handle a combination of leased lines, dial-up fallback modems and a video display monitor.

The two-port system without a modem is \$1,150. The four-port system including the modem costs \$1,795, and the six-port version sells for \$1,995 from Backus Data Systems, Suite 110, 1440 Koll Circle, San Jose, Calif. 95112.

## SNA Release Announced

(Continued from Page 51)

All Honeywell SNA facilities execute under control of its Gcos 6 MOD 400 operating system, which has been enhanced in Release 3.0. Honeywell also announced. In addition to providing enhanced SNA compatibility, it is said to feature data base management capabilities, support of Pascal and expanded transaction processing. Release 3.0 of the MOD 400 is available now for an annual license fee of \$2,500 and related products will be available in June.

Honeywell's Office Automation Systems (OAS) Release 2.1, which runs under the enhanced operating system, was also introduced recently. It supports a menu-driven OAS document transfer said to allow users to utilize Honeywell's Distributed Systems Architecture, as well as SNA and BSC, the vendor said.

The OAS Release 2.1 will be available in April for an annual primary license fee of \$1,710.

More information is available from Honeywell, 200 Smith St., Waltham, Mass. 02154.

## Modemsplus Introduces SNA/SDLC Converter

DECATUR, Ga. — Modemsplus, Inc. has announced an IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) protocol converter said to allow the use of both bit-oriented and character-oriented protocols, either separately or combined.

The Synchronous/Asynchronous Multiprotocol Remote Terminal Emulator (Smrte One) reportedly provides four serial ports and one receive-only printer parallel port and can convert SDLC to Bisynd or SDLC to

Asci. Any serial port may be used as the main I/O, while the other ports may be configured uniquely as required by the attached hardware.

The Smrte One also features, according to the vendor, a 24-char LCD. The display calls up the main menu, which includes protocol desired, port location, transmission rate, device selection and diagnostic routines.

The unit price for the Smrte One is \$3,995 from Modemsplus, 217 E. Trinity Place, Decatur, Ga. 30030.

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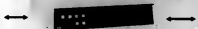
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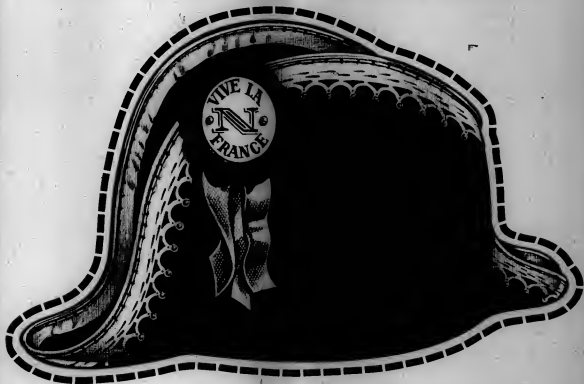
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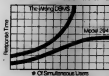
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## Three Versions Offered

# 'Teleterm' Targets Micros

WILLINGBORO, N.J. — Telexpress, Inc. has released three versions of Teleterm, the Telexpress communications system software.

Teleterm is an intelligent terminal software package that reportedly allows the user to use a microcomputer for asynchronous communications through an RS-232C link over telephone lines, through a protocol converter or directly wired to another computer.

Teleterm features include the ability to download and upload files directly from disk-to-disk between Teleterm systems, file transmission

directly from disk, on-line/off-line text editor and Videotex Control Code support for accessing, time-sharing services.

Two of the new versions are for the Radio Shack TRS-80 Model II/16 and the newly released TRS-80 Model 12 and a Digital Research, Inc. CP/M version for the Model II. A third version for the IBM Personal Computer running under PC-DOS will be released in March.

Pricing for the Teleterm system is \$89.95 for the IBM Personal Computer versions and \$165 for the Model II/16, the Model 12 and the CP/M versions. More information is available from Telexpress through P.O. Box 217, Willingboro, N.J. 08046.

## SW10 Emulates DEC VT100

TUSTIN, Calif. — General Terminal Corp. has introduced a low-cost alternative to the Digital Equipment Corp. VT100 featuring a VT100 look-alike keyboard.

The SW10 has eight programmable function keys, each of which can reportedly store up to 20 characters. The unit includes a printer port with pass-through capabilities accommodating 132-col. printing operations while recognizing a "printer busy" signal.

Standard equipment includes 20 mA current loop, English-language setup mode, graphics character set, slow scroll and split screen, according to the vendor.

The terminal costs \$849 from the vendor at 14831 Franklin Ave., Tustin, Calif. 92680.

## DSU Buffers Link Bell's DDS

NEWPORT, R.I. — Avanti Communications Corp. has introduced two Digital Service Unit (DSU) buffers designed to join Bell system Dataphone Digital Service (DDS) links together. The company also announced two new features for its family of Local Area Data Distribution (Ladd).

The Models 832 and 835 DSU Interconnect Buffers reportedly will allow users who currently have DDS lines to expand utilization of lines used in their communications network. The 832 interconnects DDS link operating with an RS-232 interface at data transmission rates of 2,400, 2,800 and 9,600 bit/sec.

The Models 832 and 835 DSU Interconnect Buffers are priced at \$1,750 each.

The first addition to Ladd, the 2214 feature for military interfacing applications, provides MIL 8114 interface capabilities for the 2200 and 2300 Ladd. It costs \$300. The second feature, the 2370 feature, allows the 2300 Ladd to Interconnect terminal equipment operating at a data rate of 72K bit/sec with a Bell TI carrier operating at a line rate of 1.544M bit/sec. The 2370 feature is available on all 2300 models operating with a V.35 interface at a data rate of 1.544M bit/sec. It costs \$250 from Avanti, located at Aquidneck Industrial Park, Newport R.I. 02840.



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## Works Via Xerox X.25 Net

## Conversion Package Out

WOODLAND HILLS, Calif. — Protocol Computers, Inc. (PCI) has released a protocol conversion package that converts Ascii to IBM System/34 and System/38 communications via Xerox Corp.'s X.25 public packet network.

The package reportedly offers an alternative to leased lines and permits microcomputers, personal computers, Ascii CRT terminals and hard-copy printers to replace IBM 5251, models 11 and 12 CRT terminals.

The conversion package consists of a pair of units, the 1051X and the 735X. The 1051X interfaces between Ascii terminals and the X.25 node and provides the Ascii to IBM Sys-

tems Network Architecture/Synchronous Data Link Control (SNA/SDLC) to X.25 conversion. The 735X performs SNA/SDLC to X.25 conversion on the System/34 to System/38 host side of the network.

The conversion units reportedly permit a maximum of 56 Ascii devices to function simultaneously through the X.25 network emulating 5251 CRT terminals and 5256 printers. The 735X supports up to eight virtual circuits with each circuit supporting one 1051X.

The PCI 1051X ranges from \$4,500 for one port to \$8,500 for seven ports. The 735X is \$5,500. PCI is located at Suite 100, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

## Domain Net Gets Processor

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced a server processor for peripherals and

## Transmodem 1200

## Features Autodial

SAN JOSE, Calif. — SSM Microcomputer Products, Inc. has announced Transmodem 1200, a 110- to 1,200 bit/sec full-duplex modem.

Features of the unit include autoanswer/autodial, automatic speed detection, Touch-Tone and pulse dialing and logon password storage. The unit can be used with any processor with an RS-232 interface, the vendor said.

The Transmodem 1200 costs \$695, the vendor said from 2190 Paragon Drive, San Jose, Calif. 95131.

communications that reportedly expands its Domain network's resource-sharing capabilities and improves virtual nodes' computational performance.

The Domain Server Processor 80 includes a 32-bit very large-scale integration central processor, up to 1.3M bytes of main memory, a subset of Apollo's Argus network-wide virtual memory operating system and a five-slot Intel Corp. Multi-bus card cage, according to a vendor spokesman.

Prices start at \$7,000 for a 5M-byte configuration. The company is located at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

## ACC Introduces Acces Addition

(Continued from Page 51)

NS software modules reside in the host computer. One of these modules, the Network Interface Module (NIM), communicates with network hardware via the host's bus and appears in the system as an I/O driver. By choosing an appropriate NIM, the NS package can be configured to operate with hardware from a variety of vendors, a vendor spokesman said.

The second version, FE-11/NS, is said to incorporate virtually the entire NS Protocol Package into ACC's IF-11/Ethernet. This version draws upon the benefits of a dedicated front-end processor to increase network performance and to reduce the host's processing overhead, the spokesman reported.

The NU-11/NS costs \$4,500 each and the FE-11/NS costs \$9,500 each. ACC is located at 2901 Park Ave., Soquel, Calif. 95073.

## Displayphone Out for SL-1 PBX

(Continued from Page 51)

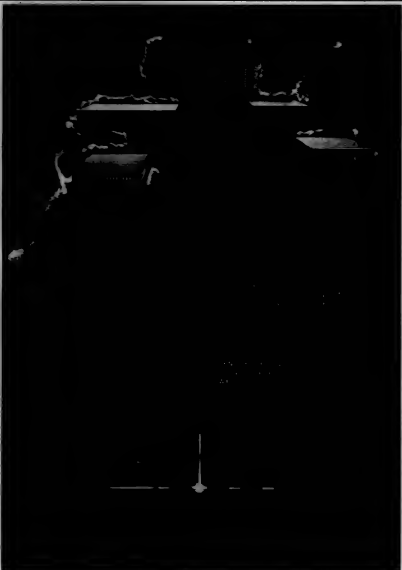
and the terminal conforms automatically. Computer logon codes can also be stored. Once the terminal is connected to a computer, the use of soft function keys can reportedly be customized for a particular application.

It has two display pages that show on the screen, one for voice and the other for data. Users can select and view either page without altering the contents or disrupting the service performed on the other.

The asynchronous data calls are placed on the data line, which provides a fully digital path through the SL-1 system at speeds of up to 1,200 bit/sec. The SL-1 Displayphone connects to the SL-1 PBX with standard twisted-pair cable, the vendor said.

As a data terminal, it operates like an asynchronous Ascii terminal and can be used in most applications where Ascii terminals are used. Because it transmits data digitally, no modems are required. However, modems reportedly can be pooled or shared by users for data calls outside the SL-1 system over the analog public telephone network.

The terminal will be available in April, Northern Telecom said from 259 Cumberland Bend, Nashville, Tenn. 37228.



## Teleram Announces Trade-In Program

WHITE PLAINS, N.Y. — Teleram Communications Corp. has announced a major trade-in program.

Through March 31, the firm will accept the following products for trade-in against the purchase of Portable/81 portable/bureau terminals: Teleram B-1800, P-1800, P-1888 and 2277 terminals; Texas Instruments, Inc. 700 series terminals; and Telcon Industries, Inc. and Peripher-

al Systems, Inc. portable and bureau terminals.

Such a trade-in will be worth \$900 toward the purchase of a Portable/81, bringing the price down to \$4,495 from \$5,395. Teleram is located at 2 Corporate Park Drive, White Plains, N.Y. 10604.

## IBM 3101 Terminal Emulator Available for Displaywriter

DELRAY BEACH, Fla. — Advanced Software Products, Inc. has announced an emulator for the IBM 3101 terminal that is available for

both the IBM Displaywriter and the IBM Personal Computer.

Both character and block mode 3101 terminals can be emulated. Advanced features include time and date stamping for printed screen images, a built-in communications trace facility and a 3101 feature editor intended to simplify the setup of the emulation sessions.

The 3101 emulator is available for both systems immediately and can be obtained on a trial basis for \$25.00. A perpetual license is available for \$300 per system and includes two years of releases and fixes. The vendor said from Tower B, 100 E. Linton Blvd., Delray Beach, Fla. 33444.

## Voice Subsystem Boasts 100 Words

ANAHEIM, Calif. — Interstate Electronics Corp. has unveiled a voice recognition subsystem, compatible with most Ascii terminals, that is said to have a 100-word vocabulary and a 99+ percent accuracy rate.

The SYS300 Voice Recognition Subsystem connects to an RS-232C line between an Ascii terminal and host computer.

The price for most units is \$1,995 from 1001 E. Ball Road, P.O. Box 317, Anaheim, Calif. 92803.

## 'Tracs' Update Transfers Data

SACRAMENTO, Calif. — Software Module Marketing, Inc. (SMM) has introduced a communications software package said to allow the transfer of batch data between different binary synchronous computers and devices. The package runs under the IBM DOS and OS operating systems.

SMM's Tracs Release 1.4 is said to feature multiple line turnarounds in a single session to support interactive batch communications, full transparency mode to allow users to transmit packed or binary data to another site and autodial to allow minimum operator intervention.

The DOS version is available for \$5.50.

The OS version is available for \$8,000 from SMM, 1007 Seventh St., Sacramento, Calif. 95814.

## Two Interfaces Released by HP

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced two interface modules for the HP 64620S logic-site/software analyzer, a general-purpose interface and an Intel Corp. 8086/8088 microprocessor-dedicated interface. The interfaces, together with the HP 64500A general-purpose preprocessor, are said to simplify troubleshooting and optimize microprocessor systems.

The HP 64651A general purpose interface includes a broadband, integrated circuit sockets, wire-wrap terminals and a cable with a processor socket for 40-, 48- or 64-pin dual in-line packages.

The HP 64651A general-purpose interface for the 8086/8088 is said to expand the current set of processor-specific interfaces.

The HP 64651A is available for \$910 and the HP 64653A for \$1,210 from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

SUNNYVALE, Calif. — International Data Services, Inc. (IDS) has introduced a communications software package said to allow the University of California at Berkeley version of Bell Laboratories' Unix operating system to communicate with Digital Equipment Corp.'s VMS operating system. The package uses interface boards from Interlan, Inc.

Osmosis runs under the Xerox

Corp. Ethernet local-area network. It is said to handle data formatting to allow the user to log on to a remote host and use the resources of that host as if the terminal were directly linked to it. It also converts text files so that the two hosts can read them in the appropriate format.

The package is available for \$33,750 from IDS, 1020 Stewart Drive, Sunnyvale, Calif. 94086.

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### PC WORLD Day March 19 Program of Events:

Located in the Ballroom of the San Franciscan Hotel, one block from Brooks Hall, San Francisco:

9:30-10:30 a.m.

#### "Systems Software for the PC"

Panel members: Gary Kiddall, President, Digital Research; Chris Larson, Director of Marketing, Microsoft; David Hughes, Independent Consultant; Syd Geraghty, President, Quantum Software; C.A. Irvine, Vice President of Engineering, SofTech Systems; Kearney Rietmann, Associate Editor, PC World.

11:00-12:00 p.m.

#### "The PC Phenomenon"

Panel members: David Bunnell, President and Publisher, PC World; Cheryl Woodard, Associate Publisher, PC World; Ron Posner, Chairman, National Training Systems; Portia Isaacson, President, Future Computing; Martin Alpert, President, Tecmar.

12:30-2:00 p.m.

#### "Second Generation Software"

Panel members: Mitchell Kapor, President, Lotus Development Corp.; Jeff Harbers, Associate Manager, End-User Division, Microsoft; Gilbert Hoxie, President, Context Management Corp.; Roy Folk, Division Marketing Manager, VisiCorp; Harry Muller, Associate Editor, PC World.

2:30-4:00 p.m.

#### "PC Multiprocessing, Networking, and Communications"

Panel members: Drew Major, Software Systems Manager, Novell Data Systems; Steve Pomeroy, Product Marketing Manager, JCOM; Steven Cook, Technical Editor, PC World; Phil Belanger, Omni Project Manager, Corvus.

4:30-6:00 p.m.

#### "PC Add-Ons—What Is Compatibility?"

Panel members: Rod Canon, President, COMPAQ Computer Corp.; Andrew Hagedorn, Editor, PC World; Dr. Robert Harp, Chairman of the Board, Corona Data Systems; Karl Koessel, Programming Editor, PC World; Steven Cook, Technical Editor, PC World; Martin Alpert, President, Tecmar.

### The West Coast Computer Faire Is March 18, 19, 20

For pre-registration at a discount for 10 or more call Computer Faire (415) 851-7077. Registration at the door for 3 days including conference program and show is \$15.

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Attendance at PC WORLD Day events is free to all participants in the West Coast Computer Faire, but space is limited to the first 500 persons so please come early to ensure you don't miss PC WORLD's presentations.

Also, visit the PC WORLD booth at Brooks Hall. Booth numbers: 1127, 1129, 1131.



# A Guide to Patenting Software

By Delbert L. Keenon and Norman R. Carlson

The U.S. Patent Office has begun issuing software patents, eliminating a particularly frustrating enigma to programmers. Following the U.S. Supreme Court's decision in *Diamond vs. Diehr* in March 1981, the U.S. Patent and Trademark Office has adopted a receptive attitude toward patent applications related to software program inventions. Prior to the *Diehr* decision, the office held steadfastly that such inventions were unpatentable. Since the decision, the office has issued several software patents, beginning in January 1982.

The *Diehr* decision has had a far greater effect than merely revising the Patent Office's attitude toward software inventions. The decision has created an altogether new

class of inventors. They work in an environment that is unfamiliar to the patent field, and their products are different in nature from mechanical, electrical and computer hardware inventions.

In view of the new possibilities for patenting software program inventions, software creators need to understand the spirit and purpose of the U.S. patent system, the essential parts of a U.S. patent and how features of software programs may be patented and licensed for income that enjoys the tax protection of long-term capital gains.

Essentially, a U.S. patent is a contract between the U.S. government (representing the U.S. public) and the inventor. A patent confers upon its inventor an exclusionary

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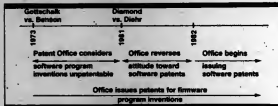


Figure 1. Timeline for Program Invention Patentability

right — that is, the right to exclude members of the public from making, using or selling the invention. But this right is not conferred upon the inventor forever. In general, it "dies" 17 years after the patent is issued. After the right expires, anyone may use or sell the invention, and its creator is powerless to exclude the public from such practice.

In exchange for this exclusionary right, the inventor must disclose (within the patent) enough informa-

tion to enable a public member to make and use the patented invention. This requirement is sometimes known as an "enabling disclosure."

It is not necessary to enable any member of the public to make and use the invention. Instead, the disclosed information must enable one of ordinary skill in the art of the invention. The disclosure of a patent for an analog-to-digital (A/D) converter need not be enabling for a mechanical engineer who designs automatic transmissions, for example. In this case, the engineer does not possess an ordinary level of skill in the A/D art.

As another example, the disclosure of the patent for the A/D converter need not be enabling for an electronics engineer with no prior education or experience with A/D converters. Again, this person does not possess ordinary skill in the A/D art. On the other hand, the disclosure must be enabling with respect to any person familiar with A/D converters — for example, someone who designs them.

#### Promoting Progress of the Art

By making an enabling disclosure, an inventor enhances the public's awareness of the progress of the art. In this way, the art's progress is promoted more than if inventions were kept secret.

Patents relating to software program inventions are comprised of three essential parts: a body of text called the specification; a set of drawing figures; and at least one claim — usually there are several.

**Specification.** The specification is a printed text that indicates the invention's field and describes problems the invention solves. It usually emphasizes the advantages that arise from using the invention. Typical advantages include reduced cost, increased speed, improved productivity or greater accuracy. Often, the specification describes the invention's theory of operation — in other words, how the invention accomplishes its purpose. A well-written specification teaches the reader how the invention achieves advantages not previously attained by the related art.

**Drawing figures.** Most patents use drawing figures to help the specification describe how the invention is built and how it is used. In software program patents, flowcharts are common. Lists of computer and assembly-level programs may also appear among the drawing figures. Other figures may be used to convey the heart of the invention — the principle under which the invention functions.

**Claims.** A claim is a word picture that defines the invention. When there are several claims, they vary in detail. Usually, the least detailed claim appears first and is the broadest or most comprehensive.

From the point of view of patent law, the invention exists only as it is

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defined by the claims. The invention is not found in the inventor's notebook, nor in a prototype of the invention before its manufacture, nor in a commercially available manufactured object that embodies the inventive principle.

Fundamentally, the claims define exactly what the public is excluded from making, using or selling. Therefore, claims must be clear and concise. Moreover, the claims are the vehicle for licensing others to make, use and sell the invention. If the claims are properly licensed, they permit the inventor or patent owner to enjoy licensing fees (royalties) that qualify as long-term capital gains. In this event, the royalties are taxed at a lower rate than ordinary income.

## Historical Development

The history of software patents centers on two landmark Supreme Court decisions. In the first, *Gottschalk vs. Benson* (1973), the court held that claims for an algorithm used in a digital computer to convert binary code decimal numbers to equivalent pure binary numbers were unpatentable. In the second case, *Diamond vs. Diehr* (1981), the court held that claims for a method of operating a rubber molding press, in which parts of the method are performed by a programmed digital computer, were patentable.

In the *Benson* decision, the court defined an algorithm as a "procedure for solving a given type of mathematical problem" and reasoned that such an algorithm is like a law of nature, which cannot be the subject of a patent. Therefore, the *Benson* claims were unpatentable.

The court adhered to its principle that laws of nature, physical phenomena and abstract ideas are excluded from patent protection. Naturally occurring minerals and plants also fall within this group, as do mathematical equations that express laws of nature — for example,  $E = mc^2$ .

The U.S. Patent and Trademark Office held steadfastly that the *Benson* decision meant software program inventions were unpatentable. Nevertheless, the Patent Office did not oppose issuing patents for inventions that arose in *firmware* programs (see Figure 1).

In the *Diehr* decision, the

court considered claims for a method of operating a sub-ber molding press for precision-molded rubber compounds. The method is carried out with the aid of a (software) programmed digi-

tal computer. When an article is placed inside the press for curing under heat and pressure, an interval timer in the computer is initiated as the press is closed. During the curing process, the com-

puter repeatedly monitors the temperature at a location within the press and close to the mold cavity.

The computer stores data pertaining to the geometry of the mold and the batch of

rubber being molded. Each time a temperature value is observed, the computer uses that value with the stored data and a mathematical equation to calculate the total required curing time. In

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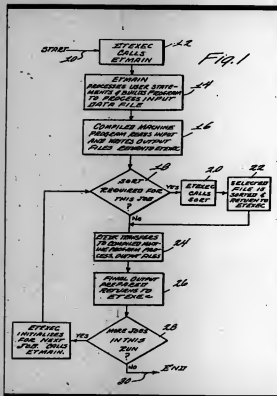


Figure 2

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other words, the computer calculates the total time that the press should be closed to complete the cure. When the calculated cure time and the elapsed time since closure of the press are the same, the press opens automatically.

The court reasoned that the Diehr claims "were not directed to a mathematical algorithm or an improved method of calculation, but rather recited an improved process for molding rubber articles by solving a practical problem which had arisen." Therefore, the court concluded that the Diehr claims were patentable.

In its opinion, the court defined a process as "a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject matter to be transformed or reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. The process requires that certain things should be done with certain substances and in certain order."

#### Typical Software Patents

The following examples show the variety and nature of some of the software patents issued in the past year. In some cases, the inventors are independent; in others, they represent large corporate employers. The figures are taken from the patents

themselves. Two patents to independent vendors are considered first.

**Compiler improvements.** In January 1982, the Patent Office issued what is considered to be the first software patent to an independent inventor, Robert I. Becker (U.S. Pat. No. 4,309,756). This patent concerns an improvement in compilers that convert from source code to object code in a single step. The claims define a method for use under program control in a digital computer.

This method constructs an array of logical linkages that permits direct compilation of an efficient and optimum-size set of machine-executable instructions. These instructions evaluate compiler-level logic condition sets without constructing the usual logic decision tables. The resulting set of instructions is nearly optimum in terms of both the core storage area used and the object program execution time (see Figure 2).

**Securities valuation system.** In June 1982, the Patent Office issued a patent for a securities valuation system to Frederick C. Towers (U.S. Pat. No. 4,334,270). This patent discloses a method of operating a general-purpose digital computer to produce securities portfolio valuation schedules for several simultaneous users. The computer maintains securities information in timeslice files that are updated, both electronically and

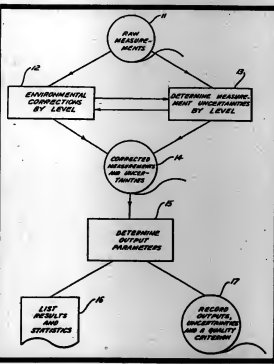


Figure 3

manually, on a daily basis. The system permits each user to store information about his portfolio, as well as information about supplemental securities not included in the system-wide files.

The next two examples concern software patents whose inventors are employed by large corporations.

**Method of evaluating formations.** After drilling a well through geological formations that may bear producible hydrocarbons, various instruments are placed in the well before casing is installed. These instruments record initial data that may be processed to yield desired output parameters. The parameters are more useful in determining the presence of hydrocarbons than are the initial measurements. If the output parameters are indicative of producible hydrocarbons, casing is installed and the well is produced.

This patent (No. 4,338,664) discloses a method of processing the initial data to derive a set of output parameters that minimize weighted deviations between the actual measurements and values of the measurements calculated from the output parameters. This minimization gives the most probable output pa-

rameters, whose uncertainty is in turn calculated. The computed values of the measurements are plotted alongside an indication of the range of uncertainty of the actual measurements. This comparison provides an indication of the reliability of the derived output parameters, which are also plotted with or without their own range of uncertainties (see Figure 3).

**Method for automatically correcting spelling errors.** This patent (No. 4,355,371) discloses a system for matching a misspelled word against various candidates from a dictionary to find the best match of the misspelled word. The major facility offered is the ability to discern the degree of apparent similarity between words that do not perfectly match a given target word without requiring the tedious procedure of character-by-character positional matching. Such matching requires shifting and reassignment to accommodate for differences between the candidate and target words.

The system includes a method for storing and retrieving words from a dictionary based on their likelihood of being the correct version of a misspelled word. The words are re-

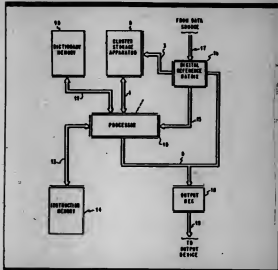


Figure 4

viewed to reduce further the number of candidates that must later be examined in a high-resolution positional match to find the candidate with the greatest character affinity. The technique reduces the number of candidates in contention in order to make a high-resolution match feasible on a real-time basis (see Figure 4).

#### Opportunities and Advice

The new software patents offer unparalleled opportunities for patenting program innovations and licensing patented software program inventions for long-term capital gains. Among those who can benefit are independent programmers and

contractors, personal computer enthusiasts, computer hobbyists or anyone else who creates software, whether self-employed or employed by corporations. Some advice on the patenting and licensing process follows.

First, remember that only features of programs — not entire programs — are patented. When developing a program, identify its important features. Next, consider whether these features are new and whether they achieve particular advantages. New and advantageous features are candidates for patenting.

A program feature must be new both with respect to existing U.S. patents and with respect to the tech-

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# PATENTING SOFTWARE

In Depth/6

## IN DEPTH

nical literature within and outside the U.S. While the body of U.S. patents for software inventions is still small, there is a good deal of technical literature on the subject of software.

The exact criteria for determining newness are specified by the U.S. Patent Code.

In order to be patentable, a program feature must not only be new, but also "nonobvious." While it is difficult to define that quality, strong

indications of it are provided by "significant advantages."

It is important to keep records. Most inventions have a conception date and a date of reduction to practice. The former is the point of time at which the invention was conceived as an idea. The latter marks the point at which the idea accomplishes its intended purpose in practice. Many inventions are patented after their reduction to practice.

Maintain good records of the con-

ception date and of the activities related to reducing the invention to practice. These records must be properly witnessed. A good reference on this subject is *How to Protect and Benefit From Your Ideas*, available from the American Patent Law Association, 2001 Jefferson Davis Highway, Arlington, VA 22202.

### Proper Licensing

An inventor or owner of a patent may license another party (licensee)

to make, use and sell a patented invention in return for licensing or royalty fees.

Patent royalties may be treated as long-term capital gains to the inventor or patent owner, provided that all substantial rights to the patent are transferred to the licensee. Capital gains are advantageous because they are subject to less tax than ordinary earned income.

In order to transfer all substantial rights to your patent, you must observe the following general rules (as explained in *How to Protect and Benefit From Your Ideas*):

1. All claims of the patent must be licensed.
2. The license must be exclusive. In other words, there must be only one licensee.
3. You must not keep a geographic territory for yourself.
4. You must not limit the exclusive licensee to a particular use under your patent.
5. The license must not expire before the expiration date of the patent itself.

### About the Authors

Delbert L. Keenon, author of several articles and patents on computer control systems, founded Automation, Inc. in Houston in 1971 to market computer control technology.

He also conducts microcomputer training workshops.

Norman R. Carlson, Textstar Publications, Inc., is the holder or co-holder of 15 U.S. patents, many of which cover computer control and simulation applications. He is the author of a book related to interpreting logs of measured data from producing oil and gas wells, and he designs programs for computerized well-site analyses of these logs.

Keenon and Carlson conduct a seminar on the fundamentals of patenting software.

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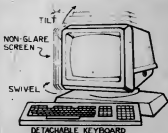
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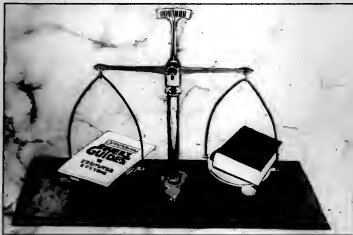
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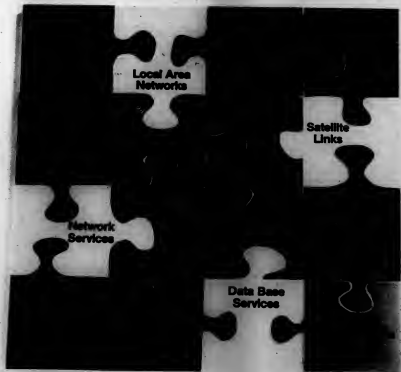
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March 21-24, 1983

Miami Beach Convention Center, Miami Beach, Florida

Co-Sponsored by **BusinessWeek** and **Data Communications** Magazines

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# Conference Schedule & Exhibit Hours

**Monday, March 21, 1983**

**Exhibit Hours: 10:30 AM-5:00 PM**

|             |         |                                                        |
|-------------|---------|--------------------------------------------------------|
| 5:15-10:45  | Keynote | LINKS TO THE FUTURE                                    |
| 10:00-10:30 | HC-1    | Communications Processors and Statistical Multiplexers |
| 11:00-12:30 | SB-1    | Information Management: Environmental Analysis         |
| 11:00-12:30 | SB-1    | The OSI Model: New Developments                        |
| 11:00-12:30 | DI-1    | Video Conferencing: How and When to Use It             |
| 11:00-12:30 | EM-1    | Utilizing Relay Groups: Statistics Securing Today      |
| 11:00-12:30 | HC-1    | Voice Recognition & Synthesis                          |
| 11:00-1:00  | DC-1    | DataComm Concepts and Components                       |
| 3:00-5:30   | IP-1    | INTERFACE PAPERS                                       |
| 3:30-4:20   | HC-2    | Modems: A Cost-Performance Spectrum                    |
| 3:30-5:00   | HC-1    | International Telecomm Regulations                     |
| 3:30-5:00   | SM-2    | Information Management: Strategy Development           |
| 3:30-5:00   | ES-2    | IP/TCP Protocols: Implications and Prospects           |
| 3:30-5:00   | DI-2    | Voice Mail: Digited Store and Forward Voice            |
| 3:30-5:00   | EM-2    | Terrestrial Microwave: DTS-DEM'S and Beyond            |

**Tuesday, March 22, 1983**

**Exhibit Hours: 10:00 AM-5:00 PM**

|             |      |                                                         |
|-------------|------|---------------------------------------------------------|
| 8:00-9:00   | ND-1 | Early Java I: AT&T Dives into                           |
| 8:15-10:45  | ND-2 | Diversification and Disruption: Impact on Users         |
| 11:00-12:30 | HC-2 | Intelligent Terminals and Desktops                      |
| 11:00-12:30 | ND-3 | AS/AMERICAN Bell: Early Discharge                       |
| 11:00-12:30 | SB-2 | Information Management: Planning                        |
| 11:00-12:30 | OP-1 | Data Base Distribution Trade-Off Considerations         |
| 11:00-12:30 | DI-3 | Computer Network (Electronic) Mail                      |
| 11:00-12:30 | DI-1 | Towards 100% Uptime                                     |
| 11:00-1:00  | DC-2 | The Software of DataComm                                |
| 3:00-5:30   | IP-2 | INTERFACE PAPERS                                        |
| 3:30-4:20   | HC-3 | Hard Copy Communications                                |
| 3:30-5:00   | SM-3 | Information Management: Implementing the Plan           |
| 3:30-5:00   | LA-1 | LAN Tutorial Overview                                   |
| 3:30-5:00   | OP-2 | SDP Users: Case Studies in Action                       |
| 3:30-5:00   | DI-4 | From WP to the Integrated Office: Making the Transition |
| 3:30-5:00   | HB-3 | Seminars for 1990                                       |

**Wednesday, March 23, 1983**

**Exhibit Hours: 10:00 AM-5:00 PM**

|             |      |                                                       |
|-------------|------|-------------------------------------------------------|
| 8:00-9:00   | SM-5 | Early Java II: Information Management Roundtable      |
| 8:15-10:45  | ON-6 | Perspectives on Office Integration                    |
| 11:00-12:30 | ND-5 | Computer-Controlled PBX: The Local/Voice/Data Switch  |
| 11:00-12:30 | DI-5 | Desktop Computers: New Tier for GSP                   |
| 11:00-12:30 | LA-2 | LAN Issues: Comparative Analysis                      |
| 11:00-12:30 | SB-3 | SNA Enhancements: The Annual Update                   |
| 11:00-12:30 | ON-7 | Performance Enhancement with                          |
| 11:00-12:30 | DI-6 | Hardware/Software Monitors                            |
| 11:00-1:00  | DC-3 | The Desktop Data Base: Packages and Trends            |
| 2:30-5:30   | ND-4 | Public Intelligent Networks: Service Trends for Users |
| 3:00-5:30   | IP-3 | INTERFACE PAPERS                                      |
| 3:30-4:20   | HC-4 | Fiber Optics: Current Offerings                       |
| 3:30-5:00   | HC-5 | New International Services                            |
| 3:30-5:00   | LA-3 | LAN Users: Case Studies in Action                     |
| 3:30-5:00   | SB-4 | Micro-to-Mainframe: Compatibility Issues              |
| 3:30-5:00   | ON-8 | New Models for Network Optimization                   |

**Thursday, March 24, 1983**

**Exhibit Hours: 10:30 AM-5:00 PM**

|             |          |                                                     |
|-------------|----------|-----------------------------------------------------|
| 8:30-8:30   | HC-7     | New Products for Tech Control                       |
| 8:30-10:00  | LA-4     | LAN Getting: Building and Neighborhoods             |
| 8:30-10:00  | SB-6     | On-the-Shelf Packages for Desktops                  |
| 8:30-10:00  | DC-4     | ICOM Updates                                        |
| 8:30-10:00  | DI-6     | Public Data Base Services for Business Applications |
| 8:30-10:00  | HC-6     | Optical Fibers and Laser Beams                      |
| 8:30-10:30  | DC-4     | Network Architectures                               |
| 10:45-11:45 | Lecture: | THE TECHNOLOGY VECTOR                               |
| 12:00-1:30  | LA-5     | LAN Interconnect: The Big World Beyond              |
| 12:00-1:30  | BR-4     | Cable TV Projections                                |
| 12:00-1:30  | DI-7     | Data Base Packages for Net Control and Management   |
| 12:00-1:30  | HC-6     | Desktop Down the Road                               |
| 12:00-1:30  | ON-9     | SNA Net Performance: Special Considerations         |
| 1:30-2:00   | IP-4     | INTERFACE PAPERS                                    |

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INTERFACE '83 gratefully acknowledges the numerous contributions of this year's Industry Editors Advisory Board and Program Committee. Once again, these men and women have been of immeasurable assistance in the planning and preparation of another dynamic Conference.



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# The Conference



**The INTERFACE '83 Conference will help you put the entire Data Communications/Information Processing picture together. In a field where new generations of technologies, services and applications break through each year, our 57 Conference sessions will help you make sense of it all!**

**Stimulating topics deal with critical issues facing the industry today and talk about what's ahead in the future. Listen and learn from the industry's leading experts as they present the hottest subjects in their respective fields.**

**Benefit from the Conference's clear and practical advice. Avoid piece-meal solutions. Come to the INTERFACE '83 Conference and focus on the total picture.**

## KEYNOTE: Links to the Future

Communications links have a synergistic effect on computational power. For 11 years now, that has been an underlying premise of the annual INTERFACE Conference and Exposition. This year, with the judicial unleashing of AT&T and IBM, communications links indeed become the principal links to a future now coming into view. Burdened with daily headlines emphasizing recession/depression and unemployment, we tend to miss the other side of the coin: America is going through a profound (and painful) transformation. What lies on the other side will be different, and better.

## New Directions

It's been more than a year now since the historic decisions involving AT&T and IBM. Virtually all sessions in this year's INTERFACE Conference will reflect, to greater or lesser degree, the impact of these events. But this group of sessions has been specifically designed to provide attendees with background facts and forecasts stemming from the reconfiguration of the industry's two leading companies.

**ND-1 Early Java I: AT&T Divestiture Tuesday, March 22, 8:00-9:00**  
This session will provide an authoritative briefing on the historical record of the AT&T divestiture agreement. The communications landscape changed forever on January 8, 1982, when the US Government dropped its anti-trust prosecution in return for certain concessions from M. Bell. Disregarded consultant Ralph Bagnard will analyze the record of this extraordinary case, thus providing indispensable background not only for other sessions in this key group, but also for this year's entire INTERFACE Conference. Coffee and lunch will be served.

Chair: Ralph G. Berglund  
Industry Consultant

**ND-2 Divestiture and Deregulation: Impact on Users Tuesday, March 22, 9:15-10:45**  
This "big picture" plenary session will focus on the impact of deregulation will have on all users. Will communications cost more or less in this new competitive environment? Will there be more competition? Who will regulate which carriers? The issues for interchange carriers, state utility commissions and AT&T/Telcel concern users will be discussed.

Chair: Richard L. Deal  
President  
Richard L. Deal & Assoc.

**ND-3 AIS/American Bell: Early Directions Tuesday, March 22, 11:00-12:30**  
American Bell executives will speak in this session, providing an authoritative company perspective on current and future offerings. BellSouth will be on AIS/Net 1000, both the present Release 1 and Release 2, due later this year. American Bell has very ambitious plans, which now must face the challenge of a competitive marketplace.

Chair: Frank Vigilante  
VP - Large/Enterprise Systems  
AIS Division  
American Bell

**ND-4 Public Intelligent Networks: Service Trends for Users Wednesday, March 23, 8:30-9:30**  
Entering from quite different points on the spectrum, both IBM and American Bell have dramatically altered the marketplace for public intelligent network services. They join GTE, Telcel, Tymnet and others in offering users a rich menu of new options. Radical growth in public network utilization lies ahead for users in the coming years. This panel brings together representatives of major carriers in this expanding area.

Chair: Walter Levy  
President  
Edgewood Computer Associates

## DataComm School

Since 1973, The INTERFACE Conference has been known for its DataComm School. Over the last 10 years, thousands of attendees have passed through its portals, receiving in four short days a remarkably comprehensive introduction to the arcane discipline of data communications.

**DC-1 DataComm Concepts and Components Monday, March 21, 11:00-1:00**

The first DataComm School session offers an indispensable overview (or walk-through) of a total data communications system, from the message point to the user's desktop. Each principal element will be discussed, including front-end processors, modular multiplexers, terminal emulation services and protocols. Concrete applications will be offered for such key concepts as digital signaling, parity bits, half/full duplex, synch/asynch, ASCII and switched circuits/line times. While this session won't make you an expert, it will enable you to talk with one.

Chair: Gilbert Held  
Director  
F-Digital Consulting

**DC-2 The Software of DataComm Tuesday, March 22, 11:00-1:00**

Hardware is inert; software makes it happen. This introduction to data communications software will examine programming strategies for data link controls and protocols, synchronization, error control, addressing and polling. Higher level protocols such as SDLC and X.25 will be discussed. This session will provide a good introduction to more advanced software topics elsewhere in this year's INTERFACE Conference.

Chair: David L. Peasmore  
Staff Consultant  
Network Strategies Inc.

**DC-3 Transmission Techniques and Services Wednesday, March 23, 11:00-1:00**

Our DataComm School introduction to transmission techniques and services will examine the public data net network, along with contemporary private local and satellite services. Both 2-point and multi-point configurations will be discussed, as well as the potential for improving line utilization through a variety of multiplexing techniques. The session concludes with a look at Bell's Dataphone Digital Service (DDS) and similar services from other carriers.

Chair: John A. Hester  
Mgr. Planning & Evaluation  
Electronic & Telecom.  
Atlantic Richfield Co.

**DC-4 Network Architectures Thursday, March 24, 8:30-10:30**

Though it often seems that there are so many networking concepts as there are networks, the reality is actually much simpler. Topics in this concluding session of DataComm School will include basic network configurations and standards for network architecture, achieving network transparency, intelligent data network services and, of course, a brief introduction to the advanced network strategy—IBM's Systems Network Architecture (SNA). More specialized and demanding sessions on networking are scheduled throughout the INTERFACE Conference.

Chair: Dr. Philip H. Emlaw, Jr.  
Prof. Sch. of Info. & Computer Sci.  
Georgia Institute of Tech.

## Strategies For Information Management

Information management is becoming a strategic function, as opposed to what has been until now merely an administrative task. The range of alternatives for information management has broadened enormously, requiring a variety of new, complex and interrelated decisions. Considered collectively, these decisions define an organization's information management strategy. This key group of sessions will deal with the strategy, development and implementation of information management.

### SM-1 Information Management: Environmental Analysis

Monday, March 21, 11:00-12:30

The environment of information management has become chaotic. Rapidly emerging new technologies, proliferation of vendors, fragmentation and further pressures from users to "do their own thing," all compound the challenges. The information management executive must identify technical and regulatory trends that pose the greatest opportunities and risks. This session will address these trends and risks, and the associated management issues.

Chair: Christopher Meyer  
Senior Associate

Temple, Barker & Spence

### SM-2 Information Management: Strategy Development

Monday, March 21, 3:30-5:00

What is the best way to meet the organization's needs within a volatile environment? One effective technique is to adapt traditional strategic planning to the information management function through a process that helps ensure that information management strategy will be integrated with business strategy, and not vendor or product driven. This session will present both the rationale and the elements of a strategic planning process for information management.

Chair: Bernard Mahdavi

Principal of Info Mgmt. Systems

Temple, Barker & Spence

### SM-3 Information Management: Planning

Tuesday, March 22, 11:00-12:30

As users and senior management become more sophisticated and more demanding, the need for their involvement in technical decision-making is increased. This strategic planning methodology utilizes a conference approach that ensures full participation and commitment on the part of those who will implement the resulting plan, and offers a structured process for the ongoing definition and management of issues and implementation of competing requirements.

Chair: R. Anna Payne

Associate

Temple, Barker & Spence

### SM-4 Information Management: Implementing the Plan

Tuesday, March 22, 3:30-5:00

Implementation of even the best plan entails substantial technical and organizational risks. These risks can be minimized through an implementation approach which recognizes the capabilities and limitations of the information services organization and the culture of the entire organization. Senior managers and implementers are advised to arrive early at this session and stay late.

Chair: Steve Levine

Sr. Associate

Info. Mgmt. Sys. Group

Temple, Barker & Spence

### SM-5 Early Java II Information Management Roundtable

Wednesday, March 23, 8:00-9:00

Planning methodology, however elegantly constructed, must meet a pragmatic, hard-to-define test for the operating manager. Information management executives, each with recent special experience, will share major dilemmas and decisions. As they respond to tough questions from INTERFAC attendees, coffee and donuts will be served.

Chair: John Jacobs

General Manager

Info. Mgmt. Sys. Group

Temple, Barker & Spence

Peter Schemm

VPI-MIS

CBS Inc.

Pat Mounsey

Vice President

Information Services

American President Lines, Ltd.

Marshall Cheney

VP-MIS

Santa Fe International

## International Networks

Worldwide recession has squeezed not only the flow of goods, but also the flow of data. Troubled countries seeking an edge threaten to squeeze trans-border data flow still further. Thus the special significance this year of our group on international networking. The lead-off session will update current policy and regulatory trends affecting international users. The concluding session will review new international telecommunications services. Binary logic can still replace Esperanto, but only if users deepen their understanding of the difficult situation as it now exists.

### IN-1 International Telecomm Regulations

Monday, March 21, 3:30-5:00

Inevitably, as a worldwide economic crisis takes its toll, protectionist sentiment rises, not only in matters of trade but also in the trans-national transfer of reusable data. That's what makes this year's update on the international regulatory picture so timely. It is a net-work to be reminded that change is not always beneficial; change does not always equal progress. This session will report international users of the best fact, and at the same time, advise those users to cope with an increasingly hostile environment.

Chair: Leonard Ellsworth

Chairman/President

Telecomm Systems Group

### IN-2 New International Services

Wednesday, March 23, 3:30-5:00

Even as worldwide priorities on the international scene, new services continue to be offered both by private international carriers and by the PTT (Postal-Telephone-Telegaph) authorities in the various developed countries. If your international links need some polishing, this session provides a good place to start.

Chair: Chai Olan

Vice President

Telecomm Systems Group

## Distributed Data Processing

Giving new impetus in the 80's are desktop computers and local area nets. When and how do you "distribute" not only number-crunching power but also portions of the data base itself? The distribution of a corporate or governmental data base raises, as always, a host of security/contention/access questions. DDP users have thoughtfully volunteered their collective experiences, and the group concludes with a DDP-oriented analysis of the desktop computer phenomenon.

### DDP-1 Data Base Distribution: Trade-Off Considerations

Tuesday, March 22, 11:00-12:30

When you decide to distribute data, you also decide how much of your central data base will be retained. Centralized control remains vital so that the data, independent of where it resides, is current. Recovery of data has also been a classic DBMS concern, and recovery mechanism concepts are magnified in complexity once the base has been distributed throughout a network. In the session, and you'll have a better understanding of these and other ramifications, and the update and recovery techniques you must build into the product.

Co-Chair: Dr. Dean Dell

President

The DMM Group, Inc.

Co-Chair: John King

Vice President

The DMM Group, Inc.

### DDP-2 DDP Basic Case Studies in Action

Tuesday, March 22, 3:30-5:00

The most valuable lessons are never learned in a classroom, but rather in real life. However, those pioneers who have learned some hard lessons about distributed data processing will attempt to present their hard-earned knowledge in the classroom environment provided by INTERFAC. A buzzword in the 1970s, DDP is an increasingly prevalent reality in the 1980s. Not a panacea, but rather a technological inevitability, DDP offers a new generation of users one possible avenue for growth and progress.

Chair: David Buehler

President

Communications Networks

Architects, Inc.

#### DP-3 Desktop Computers: New Tier for DDP

Wednesday, March 23, 11:00-12:30  
It was challenge enough to integrate regional office minicomputer systems into a hierarchical DDP network infinitely-based on the huge mainframe configuration at headquarters. Now comes an even more awesome challenge: as microcomputer desktop proliferates through all levels of the organization. The various compatibility and interfacing issues are innumerable. Start to overcome the inevitable confusion, as INTERACE experts cut through the underbrush of what may well be the toughest operational subject of the decade.

Chair: Dale Koteles  
Director of Research  
The Yankee Group

#### Systems & Software

Ironically, the profound developments in hardware have only served to increase the importance of the soft side of the networks. INTERACE '83 experts offer their perspectives on these soft-side issues, beginning with an update on Open Systems Interconnect from the International Standards Organization. A follow-up session will cover the continuing transformation of Defense Department protocols to the private sector. Another session deals with recent enhancements to SNA networks.

#### SS-1 The OSI Model: New Developments

Monday, March 21, 11:00-12:30  
Those working on Open Systems Interconnection (OSI) continue their variant struggle for standards, both international and domestic. As one INTERACE expert comments, "The reality is that nothing drugs into anything." Such a reality, however exaggerated, promises plenty of work for consultants, and headaches for users. New developments covered in this OSI update will include upper layer architecture, OSI management, security issues within the projected OSI environment, data transmission standards, and more.

Chair: John Bay  
Product Planner  
Cuthbert

#### SS-2 IP/TCIP Protocols: Implications and Prospects

Monday, March 21, 3:30-5:00  
IPTCP is a Defense Department-sponsored protocol suite for inter-network computer communications. Currently being tested in ARPANET, this protocol suite is also being used to establish "The Internet." The Internet Protocol (IP) provides a datagram-type service among and across various nets, using whatever lower level windows are available. All Ethernet and S.26. The Transmission Control Protocol (TCP) uses IP capabilities to provide end-to-end virtual circuit services between host computers and across networks. This is another state-of-the-art session that will define IPTCP, who is presently using it, who is supporting it, and what the implications may be for civilian users.

Chair: Elmer Blotstein  
President  
Network Magnet Assoc., Inc.

#### SS-3 SNA Enhancements: The Annual Update

Wednesday, March 23, 11:00-12:30  
INTERACE's annual update on the world of SNA this year includes the integration of new products and service capabilities, including desktop computers and associated local area nets. Recent developments in SNA test management and control will be discussed, along with protocol enhancements to support satellite-based communications. Improvements in cross-domain communications will be analyzed. This important session for so many users will conclude with a look at SNA's potential for integrating voice with data communications.

Chair: Richard L. Deal  
President  
Richard L. Deal & Assoc.

#### SS-4 Micro-to-Mainframe: Compatibility Issues

Wednesday, March 23, 3:30-5:00  
Desktop (microcomputer) issues continue their restless march through virtually all phases of this year's INTERACE Conference and, indeed, the traditional mainframe environment within which INTERACE attendees have always operated. On one level, the linking of micro to mainframe requires that the former appear to be (emulate) a complete terminal. On another level, the integration of micro into a traditional mainframe environment opens up the possibility of substantial economies—if the small machines have been purchased according to plan, other than when. Plan to attend this vital session!

Chair: John King  
Vice President  
DMM Group

#### SS-5 Off-the-Shelf Packages for Desktops

Thursday, March 24, 8:30-10:00  
As desktop computers decline in price, their value increases. How do you take advantage of this low-cost power? This session will first survey some of the more interesting software packages available over-the-counter for business applications—word processing, spread sheet forecasting, project control and more. There are also an increasing number of packages enabling desktop network interconnection. The session will examine whether it is operationally desirable to use desktops in this way, focusing on presently available off-the-shelf packages.

Chair: Charles C. Joyce, Jr.  
President  
Network Strategies Inc.

#### High Speed Futures

How practical are the emerging technologies, and what are their capabilities? The first session in this group answers those questions for voice synthesis and voice recognition technologies. Do we have a place to look for more bandwidth? The next two sessions will examine the future of satellite transmission, lasers and fiber optics, focusing on user needs to process and move more information at lower cost. Finally, this far-sighted group looks into the future of desktops.

#### HS-1 Voice Recognition and Synthesis

Monday, March 21, 11:00-12:30  
Computer voice recognition is in its infancy today, but when it becomes practical for "electronic stenographer" applications? When will we see systems capability for stored, digitized voice output (and means in one form)? This session spotlights today's practical realities of voice digitization, while assessing future theory. Speech recognition trends will also be discussed.

Chair: Michael Reibman  
Management Consultant

#### HS-2 Satellites for 1990

Tuesday, March 22, 3:30-5:00  
Users always need more bandwidth, not only to carry increasing volumes of data traffic, but also (and increasingly) voice and video signals. For long haul relay, new satellite technologies may provide some cost-effective answers. Attend this session for late-breaking developments on "antenna farms" in geosynchronous orbit.

Chair: John E. Huser  
Mgr. Planning & Evaluation  
Scientific & Business  
Atlantic Richfield Co.

#### HS-3 Optical Fibers and Laser Beams

Thursday, March 24, 8:30-10:00  
Optical fiber and laser technologies are poised on the threshold of delivering very high bandwidth tubing. Transfer of data in the "gigabit" (billions) range are not only conceivable, but also increasingly attainable. Designs and implementations of local area nets especially can benefit from the information in this session.

Chair: John Huser  
Dir. of Sales & Marketing  
Pulse Optical Systems Inc.

#### HS-4 Desktops Down the Road

Thursday, March 24, 12:00-1:30  
Remember when a 4-function calculator (without memory) lined for \$400? Today, 4-function calculators are packaged with a wrist watch for \$18. Computer wrist watches follow a similar price/performance curve. Yet there are good reasons to believe that the marketplaces struggle to price for equivalent performance, are slowing along a curve different curve. The next generation of 32 bit machines has already been announced, even as the marketplace struggles to accommodate the growing requirements of newly-minted 16-bit users. And industry believes that chip designers are close to bottling mainframe capabilities in a single slice of silicon. The trends are vivid in this key product category. INTERACE experts will be at the front.

Chair: Brian Tasse  
Staff Engineer  
Sentry-Linear

## Data Base Developments

Suppliers are offering users convenient data base packages and innovative data base services. These packages and services can be time-savers and cost-savers—if you know what you're buying. The first session covers data base packages available off-the-shelf for desktop use by managers and other executives.

### DB-1 The Desktop Data Base:

#### Packages and Trends

Wednesday, March 23, 11:00-12:30

Increasingly, desktop computers are connected to hosted data base networks. As these desktop machines become more powerful (and less expensive), it becomes increasingly feasible for them to extract and hold a local subset of the mainframe's data base. Now, and eventually, data base management software is being implemented on the desktop. Some of these packages are implemented in the "C" language, some are relational data base packages of surprising sophistication. Stay abreast of key packages and trends in this important session.

Chair: Dr. James R. Schenck-Guvel  
Superior-Spac Projects  
Senate Computer Center

### DB-2 Public Data Base Services

#### for Business Applications

Thursday, March 24, 8:30-10:00

As information becomes almost like a commodity, the number of specialized data base information services multiplies. Business users of small desktop machines can now access an extraordinary variety of data base services for information ranging from the library stock cycles to life-breathing news developments.

Organizations as diverse as Dow-Jones, the New York Times and the Library of Congress have organized huge masses of information which now can be conveniently retrieved by simple menu selection. Information is power, and these public data base services offer the potential to multiply yours! Tune in at this session for further details.

Chair: Stewart M. Merck  
President  
Stewart Merck & Assoc.

### DB-3 Data Base Packages

#### for Net Control and Management

Thursday, March 24, 12:00-1:30

Integration of net control and management software into the total data management system is a process seemingly without end, and in both sidesmen and mainstream environments. Latest developments in this important area will be discussed by technical experts from three leading vendors. The handling of network traffic can be significantly improved through response measurement and monitoring incorporated in the data base itself.

Chair: Richard R. Freeman  
Senior Engineer  
Communications Prod. Div.  
IBM

## Emerging Network Technologies

New schemes for transmission abound. For users, it all adds up to more and better services.

INTERFACE '83 speakers in this important group of sessions will analyze network technology developments from the perspective of large-scale users. The group begins with an examination of satellite transmission as it exists now. The group concludes with a look at the application potential of cable TV facilities. In between, there are some developments in terrestrial microwave which merit your careful attention.

### EN-1 Ubiquitous Relay Stations:

#### Satellites Serving Today

Monday, March 21, 11:00-12:30

This session will evaluate satellite-based telecommunications services, currently available and proposed for the near future. INTERFACE experts will also update attendees on related earth-bound ambitions of specialized common carriers. Package space isn't the final frontier, in the continuing drive to bring new and innovative services to large-scale users.

Chair: To be announced

### EN-2 Terrestrial Microwave:

#### DTS/DSP and Beyond

Monday, March 21, 3:30-5:00

Terrestrial microwave is still fundamental in most network implementations. You'll be involved on trade-offs between common and private carriers, between wide and narrow band transmissions, between various spread options and frequencies. Private microwave services will also be examined—to see what they can replace, how they adapt, what are their layout criteria, and when they stage good economic sense. This session concludes with an examination of Digital Termination Service (DTS) and Digital Electronic Service (DES).

Chair: Edward F. Tuck  
President  
Edward Tuck & Co., Inc.

### EN-3 ISDN Update

Thursday, March 24, 8:30-10:00

The millennium has not yet arrived, nor has the long-heralded Integrated Services Digital Network (ISDN), combining the transmission of information from a variety of sources—data, digitized voice and TV transmissions, etc. Yet progress is being made, principally under the auspices of the CCITT, and various governmental and private organizations around the world have put forth substantial commitments in the form of both dollars and the requisite technology. You'll want a seat in this session for an ISDN briefing that will emphasize implications for U.S. users.

Chair: Philip Black  
President  
Telestat Inc.

### EN-4 Cable TV Projections

Thursday, March 24, 12:00-1:30

Cable TV (CATV) is proposed as one technique for multi-city interconnect, thus bypassing altogether the BOC local loops. An entire CATV transmission system often resides in most major cities in parallel with conventional (BOC) facilities. What's missing are protocol/interface standards to exploit CATV for business communications. A whole new network for voice, data, and video services is on the edge of realization. Speakers will assess its feasibility for business use.

Chair: Rex Reem  
President  
Toslink Systems Inc.

## Optimizing Network Performance

New network strategies are constantly aiming to enhance or optimize performance. Using hardware and software monitors to maximize uptime is the focus in the first session of this group, designing for "fail safe redundancy" has brought many nats close to what was formerly (and by definition) an unachievable goal. The group continues with a session on performance enhancement through use of software monitors. The third session in the group provides an in-depth look at network optimization. And this group concludes with an important session on how best to "tweak" an SNA network.

### ON-1 Towards 100% Uptime

Tuesday, March 22, 11:00-12:30

Hardware and software monitors feed a constant stream of information about the network into their control centers. Unfortunately, and all too often, this information is either ignored or acted upon reflectively. The focus of this key session will include how to design in, purchase and use these indispensable network aids if you're among those plagued by network degradation, you'll begin to regain a sense of control here and if a comparison session, ON-2.

Chair: Dr. Israel Gitelson  
President  
Communications Group

### ON-2 Performance Enhancement with

#### Hardware/Software Monitors

Wednesday, March 23, 11:00-12:30

Network designers spend a considerable portion of valuable time "tweaking" their systems for optimum performance. Configuration changes and load balancing can improve both response time and throughput. Proper use of information derived from hardware and software monitors is essential for this kind of optimization. This important session is always heavily attended.

Chair: Frank Dabbs  
President  
Communications Network  
Architects, Inc.

### ON-3 New Models for Network Optimization

Wednesday, March 23, 3:30-5:00

Optimizing network performance in the design phase means more sense and is more cost-effective than "tweaking" that same performance after the net is up and running. Network technologists have developed new models for this kind of optimization; these new models will be analyzed here for their available trade-offs and most appropriate applications. INTERFACE expert Dr. Wuthrow Chow will conduct his typically thorough training.

Chair: Dr. Wuthrow Chow  
Prof. & Dir. of Computer Studies  
N.C. State University

### ON-4 SNA Net Performance: Special Considerations

Thursday, March 24, 12:00-1:30

IBM's Systems Network Architecture (SNA) continues to hold a leading share of the single user marketplace. But those same users are always pleased to discover that there are software alternatives, both hardware and software, to an increasing dependence upon the single dominant vendor. Users migrating up from binary synchronous nets can obtain special benefits from special considerations" discussed at this session.

Chair: Dr. Wuthrow Chow  
Prof. & Dir. of Computer Studies  
N.C. State University

### Hardware Connections

INTERFACE '83 experts will survey the basic technology trends (and price points) for a variety of carefully chosen product categories. From modems to MUXs, from terminals to processors, from microprocessor-controlled PBXs to the latest developments in fiber optics and tech control, these sessions are well calculated to bring attendees both on-air and up-to-speed.

### HC-1 Communications Processors and Statistical Multiplexers

Monday, March 21, 11:00-12:00

By taking over the processing chores, communications processors and statistical multiplexers greatly facilitate network performance. There's why this important product category is soon expected to be analyzed by INTERFACE experts. They will examine not only the current price points, along with their associated features, but also design trends to be kept in mind by prospective purchasers. Be forewarned, this session is often IPO.

Chair: A.A. (Tony) Carbone  
Vice President  
Tosnet Systems, Inc.

### HC-2 Modems: A Cost/Performance Spectrum

Monday, March 21, 3:30-4:30

Yes, giant billion dollar programs continue to chip away at the transformation of analog networks into all-digital transmission facilities. In the meantime, the humble yet indispensable modem not only survives, but thrives. That's why, year in and year out, our annual review of modems is heavily attended. There are modems for every conceivable application and pocketbook.

Technical experts will analyze the relative special significance for most INTERFACE users.

Chair: Gilbert Hadd  
Director  
6-Degree Consulting

### HC-3 Intelligent Terminals and Desktops

Tuesday, March 22, 11:00-12:00

Since many desktops can emulate intelligent terminals, and since intelligent terminals can perform at least some of the traditional applications associated with desktops, this INTERFACE survey of price points and trends compares the two categories. Though both product categories are analyzed within the perspective of a desktop environment, there are those special jobs for which one is much to be preferred over the other. Our experts will do a fast (manual) sort.

Co-Chair: Pete Moulton  
Principal  
Moulton & Co.

Co-Chair: Don Pivotal  
Manager - Data Communications  
Aircraft Engine Group  
General Electric Company

### HC-4 Hard Copy Communicators

Tuesday, March 22, 3:30-4:30

Net designs now have a host of new options when it comes to allocating hard copy capabilities throughout multiple locations. A regional sales office might choose a low cost dot matrix printer. At the warehouse, a high speed line printer capable of handling bulk stock might be preferred. The executive work station usually requires better quality. And so it goes, with a means of communicating just-out-of-control sufficient for all but the most refined places. INTERFACE experts will cover the latest in teleprinters, laser copiers and fax.

Chair: To be announced

### HC-5 Computer-Controlled PBX: The Local Voice/Data Switch

Wednesday, March 23, 11:00-12:00

Growing companies usually find that a faster pace of business activity quickly outgrows the limited capabilities of the traditional PBX. Enter the computer-controlled PBX, with its numerous features including optimum call routing, camp-on, abbreviated dialing, etc. in the new wide open and very competitive environment following AT&T dominance. This is a product category now in considerable flux. The session will survey some major product offerings in this category, both "near" and "proposed."

Chair: Dr. Susan Bell  
President  
The OMV Group, Inc.

### HC-6 Fiber Optics Control Offerings

Wednesday, March 23, 3:30-4:30

While the price/practicality barrier for fiber optics hasn't yet been fully broken, there are unique applications that make considerable sense right now. For example, since a fiber optic line is virtually impossible to tap without detection, applications requiring a high degree of security are now very feasible. The thin, unobtrusive capability of fiber optics is another important feature, particularly for medical and scientific data acquisition. You'll get an objective survey of current offerings and learn how to impact your own installation at some point in the decade.

Chair: Rick McNeill  
Operations Manager  
Photo/D S.O.

### HC-7 New Products for Tech Control

Thursday, March 24, 3:30-4:30

Complex networks require comprehensive control. Remote diagnostic capability is found in modems, MUXs and terminals at the cultural reaches of the net, while centralized monitoring of them is absolutely imperative. The more sophisticated the choice is not between remote and centralized control, but between the two. INTERFACE experts survey recent new products which impact this on-going struggle for network managers.

Chair: Robert J. Anderson  
2nd VP  
Chase Manhattan Bank, NA

### Local Area Networks

Future historians will remark with irony that information systems on opposite coasts were linked years before such linkage was achieved in the same building or neighborhood. But those who are now implementing Local Area Networks (LANs) are determined to make up for lost time. The group begins with a tutorial on Local Area Networks. It continues with an objective analysis of certain technological issues in LAN implementation - broadband vs. baseband, contention vs. token passing, etc.

**LA-1 LAN Tutorial Overview**  
Tuesday, March 22, 3:30-5:00  
If you, like so many of us, feel as though you have been left behind in the lists of information about the rapidly growing Local Area Networks (LANs) arena, then Dr. Howard Frank will bring you on-line and up-to-speed. You'll learn about broadband versus baseband, token passing versus contention, rings versus star, and more. Other pressure points including current cabling developments and gateways to public/private nets will also be discussed. The session will also prepare you for four additional, more specialized, LAN sessions that follow.

Chair: Dr. Howard Frank  
President & CEO  
Conti-Info Systems

### LA-2 LAN Issues: Comparative Analysis

Wednesday, March 23, 11:00-12:30

Local area networks (LAN) decisions are not as simple as choosing IBM/ole or one strategy over another. There are many trade-offs, many preferences without trade-off. Once taken, each trade-off LAN choice must confer distinct advantages, even though associated trade-offs may well be negative. In today's intensely competitive environment, the key LAN session can be your laboratory for numerous tough decisions—broadband versus baseband, token passing versus contention, and all the rest.

Chair: Dr. Philip H. Eassey, Jr.  
Prof. Sch. of Info. & Computer Sci.  
Georgia Institute of Tech.

### LA-3 LAN Users: Case Studies in Action

Thursday, March 24, 3:30-5:00

This session will feature reports from early local network implementers. Their experience in choosing what to implement, and how, will be available to those about to take the leap. Speakers will discuss the challenges of local area network decision-making through reports on how their local nets are functioning now.

Chair: Charles C. Joyce, Jr.  
President  
Network Strategies Inc.

### LA-4 LAN Cabling: Building & Neighborhoods

Thursday, March 24, 8:30-10:00

Cabling can be the most expensive and time-consuming aspect of LAN installation. Cabling must be right for present technology, and suitable for any planned expansion or upgrade. Codes must be met. All this involves choices, ranging from inexpensive twisted pair cables through to broadband coaxial and fiber optics. Which is right for your implementation, your building, your budget? You'll get some answers from INTERFACE experts.

Chair: Edward Newhouse  
Account Manager  
Transpac Electronics, Inc.

#### LA-5 LAN Interconnects:

##### The Big World Beyond

Thursday, March 24, 12:00-1:30

How to broaden the scope of your local area network into a wider world of communications and processing facilities is the theme of this important session. When you implement a LAN, you commit to a gateway strategy that can profoundly impact your global information management plan. Get it right the first time, starting here.

Chair: **Mark Forstberg**  
Vice President Operations  
ComTel Info Systems

#### Office Integration

Data Communications is the single most important technology in achieving an automated office, say the experts. Without data communications, the office cannot be automated. From this communications perspective, INTERFACE experts will discuss office systems integration. To begin with, video conferencing will be examined along with mail, both electronic and voice. Next, how do you effectively and efficiently make the transition from your current word processor to the integrated office? To wrap-up the group, leading theoreticians offer some long range perspectives on the entire phenomenon.

#### OH-1 Video Conferencing:

##### Now and How to Use It

Monday, March 21, 11:00-12:30

As the costs of plane fares and hotel rooms continue their inexorable climb, more corporate and governmental organizations consider the alternative: video conferencing. These same organizations quickly discover that video conferencing is also expensive, and often difficult to put together in a network configuration which meets operational requirements. When can a video conference be justified? Should an organization have its own video facilities? Or should it contract out to a vendor for assembly of an instant, one-time-only ad hoc video network? These and other issues will be analyzed here by INTERFACE experts.

Chair: **Randy Goldstein**  
President  
The Omni Group

#### OH-2 Voice Mail:

##### Digitized Store and Forward Voice

Monday, March 21, 3:30-5:00

Only the phone company, or perhaps a few clever work dodgers, can relate to "telephone tag." But we all pay it, more than 40 percent of the time we pick up a call, or when someone tries to call us. The proposed answer: "voice mail." Present systems (phone messages for storage and forwarding). Future systems may accept dictation for hard copy output and/or "see" stored text read back over a handset. The session offers a survey of the technology, along with available products and services.

Chair: **Donald H. Van Dusen**  
President  
Vanguard Telecomm., Inc.

#### OF-3 Computer Network (Electronic) Mail

Tuesday, March 22, 11:00-12:30

One INTERFACE expert likes to note that some "electronic mail" systems are not yet in the friendly Postman in the final delivery stage. By contrast, CompuLink Network Mail can be defined as "inter-computer file-to-file text transferers, from senders to receivers, through third party delivery systems, i.e. networks." Sounds like a mouthful, and it is. This session is very much state-of-the-art with presentations including use of computer mail relay in the Computer Science Network (CSNET), and a cost-effective survey of commercially available computer network mail services.

Chair: **Elmer Belfrage**  
President  
Network Mgmt. Assoc., Inc.

#### OH-4 From WP to the Integrated Office: Making the Transition

Tuesday, March 22, 3:30-5:00

Moving beyond stand-alone word processing into the genuine integration of office systems is a fundamental transition. A single threaded idea, and it's back to Square One. What's involved is the creation of a flexible infrastructure in support of interconnected (and compatible) systems. Tough issues abound, requiring timely management decisions at all levels. This transition isn't as easy as it looks, but you can make it look easy to those around and above you!

Chair: **Amy Wahl**  
President  
Advanced Office Concepts

#### OH-5 Perspectives on Office Integration

Wednesday, March 23, 8:15-10:45

INTERFACE brings together three leading experts for their varying theoretical perspectives on office systems integration (aka "office automation"). At the outset of the buzzes are now out on the issue ready to be put into place. But which piece should be picked up first? Enormous improvements in, where color productivity are now achievable, but detaches ranging from merely financial to "people considerations" intrude. Small case must be taken to avoid the downside risk of simply trading in the traditional paperwork kluge for an electronic version of same.

Chair: **Elmer Belfrage**  
President  
Network Mgmt. Assoc., Inc.  
Amy Wahl  
President  
Advanced Office Concepts  
Dale Kuehn  
Director of Research  
The Yankee Group

#### INTERFACE Papers

New this year at INTERFACE '83 is a series of more formal presentations, all of them in competition for the prestigious \$3,000 Karp Award (named for Harry Karp, founding editor of *Data Communications* magazine). Special sessions have been reserved for these presentations, for exact topics and scheduling see special notices posted in Registration and Conference areas. These presentations have undergone a limited screening or refereeing process.

IP-1 INTERFACE Papers  
IP-2 INTERFACE Papers  
IP-3 INTERFACE Papers  
IP-4 INTERFACE Papers

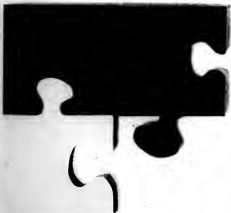
#### LOCKNOTE: The Technology Vector

Charles P. Lecht, one of the industry's most distinguished futurists, returns to INTERFACE for an encore in the role of Locknote. Once again, Mr. Lecht will summarize the major themes of this year's Conference, then extrapolate from those themes his provocative vision of our shared future. This year, the peripatetic Mr. Lecht indicates that he is fascinated by the implications of circuit density of LSI chips. Those who attend this final plenary will quickly come to share his fascination, his child-like sense of wonderment at what awaits us all.



Charles Lecht  
President  
Lecht Sciences Inc.

# INTERFACE



## The Banquet

Join us at the Second Annual Industry Awards Banquet for dinner, dancing and industry-wide awards ceremony. Co-sponsored by Data Communications Magazine, this exciting event will be held the second night of the show, Tuesday, March 22.

Highlighting the banquet will be the presentation of The Interface Award for extraordinary achievement in data communications. In addition, The Harry R. Karp Award with its \$3,000 prize for best Conference paper and The Shellys for Best Exhibits will be made.

Entertainment, following the awards, will feature internationally-renowned comedian, Norm Crosby, with dancing until midnight. Tickets are \$45 per person (black tie optional).

Limited seating will be available at the show. For preferred seating, tickets must be reserved and prepaid by March 7. Please see the attached registration form for complete reservation information.



Sheldon G. Adelson, President of THE INTERFACE GROUP, Inc. (left) presents The Interface Award to Dr. Lawrence Roberts at INTERFACE '82.

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# 83 List of Exhibitors as of January 17, 1983

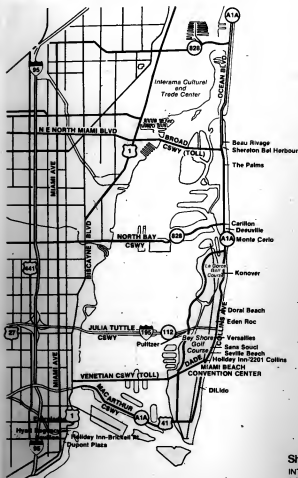
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In order to have your badge waiting for you at the INTERFACE '83 Registration Desk, we must have this form by Monday, March 7, 1983. Fill out and mail to: INTERFACE '83, 300 First Avenue, Needham, MA 02194. After March 7 - you must register on-site. Payment for Awards Banquet reservations must be received by March 7, 1983, to assure preferred seating.

To register by phone call (617) 448-6600

## Attendee Registration Form EXHIBITORS: PLEASE USE EXHIBITOR STAFF REGISTRATION FORMS.

Please print or type name as you wish it to appear on your badge.

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(All full or one day conference fees include admission to the exhibits.)

- ☐ CF-Full Conference (includes Conference Proceedings) . . . \$225  
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## IN DEPTH

# MANAGING DEPARTMENTS IN CONFLICT

By Stephen Jacobus

One of the most destructive forces at work in the office is inter-departmental conflict.

Managers vying for leverage and for positions of increased power are as common in DP as in any other field, but the great amount of organizational change in DP tends to heighten the effects of conflict. Antagonisms between managers often produce antagonisms between departments, with degraded communication between segments of the organization and a loss of productivity. Out of loyalty, employees may forget that their primary goal should be working at defined tasks, not protecting their image and guarding territories.

In most cases, some conflict is inevitable. But can conflict be reduced to a manageable level? Is conflict always bad?

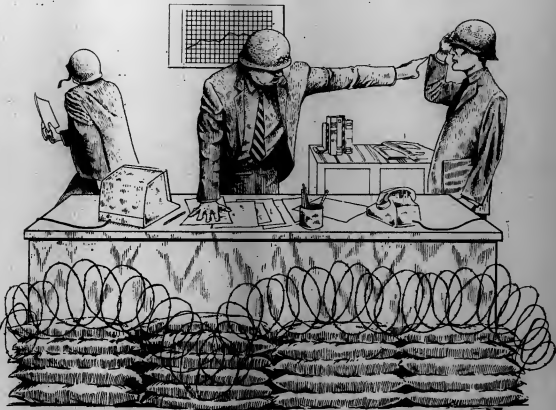
Conflict between groups — and between departments — has been of interest to managers for many years. Neverthe-

less, recognizing and evaluating conflict remains an arcane and poorly understood art, despite its potentially disruptive influence on productivity.

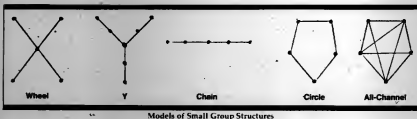
Interest in groups got a boost from research done in the '20s at the Western Electric Co. Hawthorne plant in Cicero, Ill. These studies produced some unexpected, but important results.

The Hawthorne studies began with tests on changes in the physical environment — lighting, machine speed and rest breaks. The study also used a control group, on which no real changes were made. Inexplicably, production increased for both the study group and the control group.

Failing to find the consistency they expected, the researchers began to study social factors. They focused on small groups, their formation and interaction. This was the nominal



## IN DEPTH



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beginning of the study of small groups and human relations thinking.

An important result of the study became known as the Hawthorne effect that is, the introduction of researchers or other indicators of interest influenced the system, often positively. The researchers' mere presence increased productivity. This implies that isolating the effect of the research can pose complex constraints on how studies are conducted.

F. Roethlisberger and W. Dickson, writing on the Hawthorne studies, asserted that work behavior cannot be understood without examining the informal organization of the group and its relation to the total-social organization of the company.

What is the "informal organization"? Typically, there are social groups cutting across departmental boundaries. For the astute manager, awareness of these informal structures may prove the key to improving communication flow between groups.

### Group Structures

How are work groups usually structured? In *Behavior in Organizations* (Little Brown & Co., Boston, 1974), Dorothy Harlow and Jean Hanke offer five models of small group structures, as shown in the figure above.

In the first three, most communication goes through one person. These are more commonly found in task-related groups. The remaining two (circle and all-channel) are rarer, even though most staff employees would like to see open communication between members. When one of the members is a supervisor who is struggling for control, he may prefer the wheel or Y group, with himself at the pivotal position.

Which of these is most efficient? When communicating with other groups, the wheel and Y patterns are preferred, with the communicator at the pivot. If the communicator has somehow been displaced from the pivotal position, though, problems arise. When a group is assigned to tackle large, multidimensional projects, the all-channel group is preferred, because of the free interchange of information.

### Group Performance

Many factors influence group cohesiveness, such as one's perception of group membership and frequency of interaction. Formally defining a group by job title (for example, a group of systems console operators) is the most obvious way to specify membership, but members of such groups can have stronger allegiance to informal groups, such as a group of softball players or young, upwardly mobile employees in a certain plant.

Managers tend to think primarily in terms of formal created groups, but formal membership in a particu-

## IN DEPTH

lar department does not guarantee that an employee's behavior will follow expected patterns.

Size also affects a group's work. In larger groups, the individual members interact less. However, as group size increases, the tendency for members to generate group solidarity and to give suggestions increases. As group size decreases, members show agreement, release tensions and give suggestions less.

How large is the optimal group? Of course, this depends on the tasks the group is to perform. Groups required to take action (for example, a group of managers) should consist of no more than six or seven members, while fact-finding groups may swell to 13 or 14 members without loss of efficiency.

Another factor is how similar the group members are. Most people assume that a homogeneous group performs a task best, because dissension is less likely. Many managers, however, seem to prefer a mixture of younger and older employees with varying amounts of experience and some with cross-training in other areas. Others say they have little choice but to take the best candidates, regardless of these factors.

In *Behavior in Organizations*, Harlow and Hanke claim that extreme heterogeneity within groups impedes the development of members with low status. In these groups, managers have to make special efforts to bring junior members along, lest they languish and develop too slowly.

#### Group Norms

A number of writers have stressed the development of group "norms" as inevitable. A norm is a group consensus of sanctioned behavior — often a sign of allegiance to the group.

For example, the new worker who strives for high performance may exhibit behavior that runs directly against the existing group norm. When this happens, senior group members tend to force the new member to conform or they eject him, either socially or physically.

New members whose behavior is in conflict with group norms can try to change the existing norms (which is very difficult), change their own behavior, form a subgroup with competing norms or leave the group. In such a situation, the pressure on the employee can be quite intense, since he may be only dimly aware of the norms.

When the norms run counter to the requirements of management, the employee tends to follow the group. This can be especially tough on the new employee, whose status may still be low in the views of both management and the group itself. However, all norms do not have a negative impact on the employee's performance. Some groups have norms for high performance.

Robert Blake has studied the interface between business groups exten-

sively. He reached the following conclusions in *Productivity: The Human Side*, (coauthored with J.S. Moulton) and *Managing Intergroup Conflict in Industry* (authored with Moulton and H.A. Shepard).

- When two groups compete for goals, the competition initially energizes group output.
- Prolonged competition between groups ultimately results in hostile feelings.
- Group norms coalesce and solid-

ify into stereotypical attitudes toward the other group, hindering accurate perception of roles and abilities.

- Internal solidarity within the group increases, and loyalty of members is expected to increase.

- Interaction between competitive groups affects the overall organization.

- Intergroup hostility can be reduced by requirements for cooperative behavior toward common goals.

Simply "renaming" the new goals as aims that require cooperation, however, increases hostility.

- The appearance of a win-lose norm within a group causes distortion of judgment, including the members' view of the group's abilities and output.

- Contact between groups in an attempt to clarify the conflict, especially without mediation, increases conflict.

- The leaders of the victorious

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# MANAGING CONFLICT

In Depth/28

## IN DEPTH

group are granted even more power. In the losing group, the leaders are attacked by group members. This follows initial attempts to attack the mediator or manager.

Two other crucial conclusions arose from the research. First, the use of a mediator without clearly defined authority to resolve specifics intensifies the conflict, often requiring further outside intervention.

Second, companies frequently ignore the existence of and the need

for formal organizations within the company. These are sometimes small groups, however tenuously defined. Recognizing these informal organizations may be necessary for optimal communication with another department. When managers insist on going through channels, they often omit the informal processes that aid communication.

### Categories of Conflict

There are three basic categories of

conflict between groups:

1. "Vertical conflict" between parties at different levels, such as the manager and his subordinate group.

2. "Horizontal" conflict between groups on the same general level (for example, between field engineering and operations or between systems support and systems development).

3. "Role conflict," in which two or more groups have overlapping or ill-defined responsibilities, leading to battles for control.

Some managers have less than ideal amounts of authority. The reluctance of their superiors may put managers in a weak position to demand absolute control over their employees.

A programming supervisor may feel the need for greater control over his staff, but because he has found it difficult to hire experienced people, his superior insists that he coddle his people to reduce turnover. This request results from the fear that the loss of key employees will make already tight project schedules impossible to meet.

In this situation, the employee can wrest considerable control from his supervisor. Control over what? The time he reports for work, how independently he works or even changes to the team's structure. This is clearly a bad situation and points out how loss of support can hinder the supervisor's ability to do his job.

Confused messages to the employee may also result in vertical conflict. The manager of communications support may formally instruct his employee to make an all-out effort to meet deadlines in implementing a new software package. However, the manager's somewhat panicky reaction at system failures forces the programmer to coach the operations staff at the expense of the project schedule. The manager's noticeable relief when the system difficulties are corrected (through the programmer's efforts) conveys the message that the programmer should indeed spend time supporting the operations staff.

A frequent cause of horizontal conflict is overlapping responsibility and interdependence. When two departments in a DP organization — for example, support and operations — are responsible for keeping the system up, blame for bringing the system down and rewards for the rescue effort are fought over with considerable energy.

When the operations department provides its own training and the training department wants to enlarge its area of responsibility, cooperation between groups is not expected, unless some factor intercedes to make a change advantageous to both.

### Role Conflict

In truth, role conflict can be either predominantly horizontal or vertical. In the examples given above, it is principally the role of the employee or department that is being questioned by another employee or group. Confused communication is the primary cause of role conflict.

The programming supervisor may see himself as the person who prods employees to meet deadlines. The supervisor's boss, however, may feel that the supervisor's principal role is to preserve the integrity of ongoing projects by making the company an attractive place to work.

The manager sees his support pro-



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grammar in the role of the software implementer. His hidden message to his employee is: "You are also in the role of operations support. Do both jobs." The employee may feel that he cannot or should not.

Both the operations and support group may feel that they "own" the computer system resources. Their responsibilities overlap and role ambiguity intensifies the conflict.

The operations staff may feel that it is best at training its own people. The training group may feel that its role is training, meaning that it "owns" formal responsibility for and authority over such functions.

Supervisors and managers assume a number of roles: controller of behavior, teacher, pusher/prodder, deliverer of priorities, mentor/friend, problem solver, chief technical wizard or nontechnical resource administrator.

The manager may not have made a conscious effort to choose one of these roles. But when this role is in conflict with that of another employee or group, communication problems are the most frequent underlying cause.

#### Causes of Conflict

All organizations experience a certain amount of internal conflict. However, long-term internal conflict may have a strong impact on work flow. Unfortunately, it is inherently difficult for an insider to assess the cause and nature of such conflict.

Nevertheless, writers such as J.M. Dutton and R.E. Walton, M. Dalton and H.A. Landsberger have identified the following seven major determinants of conflict within organizations:

**1. Task interdependence.** Task interdependence is the extent to which two groups depend on each other to perform their tasks. For example, the operations of a communications network depend on the hardware troubleshooters when performing a routine network test. The more interdependent the groups are, the more they will develop some system for interacting that tends to escape management control.

In some cases, the independent group has little incentive to cooperate with the dependent group. For example, engineering may have no desire to communicate with sales, but sales will frequently need information from engineering.

**2. Conflicting performance measures.** When organizational goals conflict, intergroup conflict can arise. It may be crucial for the programming manager to complete his project quickly, but the operations manager may demand that the new system be delivered with a complete set of documentation and training materials. Ambiguities in determining blame for production errors and in criteria for evaluating group performance can also produce conflict.

**3. Differing group norms.** The degree of differentiation, such as tight

***'Both the operations and support group may feel that they "own" the computer system resources. Their responsibilities overlap and role ambiguity intensifies the conflict.'***

vs. loose controls on employees, valuing new ideas vs. customer relations or tight vs. loose scheduling, produces more potential for conflict.

In *The Men Who Manage*, Dalton suggested that a division exists in today's organizations: Some tasks require highly impersonal

communications, clear job authority and emphasis on rules and specialization. Others require a more human orientation.

Modern companies have to deal with both categories of tasks, and conflict can result from these discrepancies. This raises the question: How does one decide which jobs should be managed in a human, as opposed to an authoritarian, style?

**4. Job or growth inequities.** When there are notable inequities

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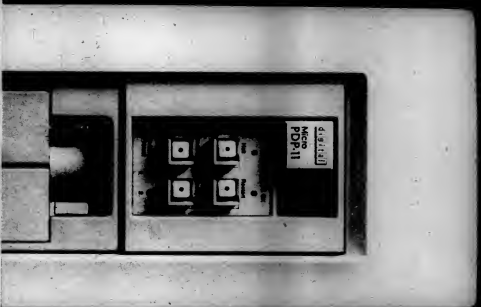
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# MANAGING CONFLICT

In Depth/32

## IN DEPTH

between jobs in different groups — such as salaries, opportunities for advancement and status — conflict can arise.

Furthermore, when one group is dissatisfied with its tasks, ambiguities in the definition of the boundaries lead to conflict. When more than one group within an organization produces documentation, ambiguities can tempt the dissatisfied group to begin maneuvering to achieve control and increased status.

Uneven distribution of information to groups causes conflict. However, the real issue may be the group's perception of power. Conflict occurs when a group feels relatively powerless compared with a second interdependent group.

**5. Competition for resources.** When certain resources or funds are sought by separate groups, conflict arises. However, if the groups are interdependent, there is an opportunity to resolve the conflict. Lack of me-

diation by an outside authority can cause open conflict.

**6. Social and personality boundaries.** A variety of gaps between departments are attributable to differences in the employees in different groups. Personal differences in training, values, education, social patterns and job status increase the potential for conflict.

For example, the staff in the programming department of a large firm is comprised of recent college gradu-

ates, principally white men and women in the age range of 22 to 26. Most have been with the firm for less than two years. A few minorities are also represented.

Their supervisor is in his early 50s, has worked for the company for nearly 20 years — since the days of unit record equipment — and holds a Ph.D. in computer science.

The operations department, on the other hand, is staffed principally by young men in the age range 20 to 22; 50% of these are non-Caucasian and have, at the most, six months of technical schooling.

Their supervisor is 28 years old and extremely bright. The supervisor also has an intuitive, unschooled ability for line management and has moved quickly in his three years with the company.

The potential for conflict in this situation is increased by the differences in group makeup.

**7. Poor communication.** Poor intergroup communication is both a source and a result of conflict. Communication is the pivotal aspect of internal conflict within organizations.

It is impossible to remedy conflict without dealing with intergroup communication, since conflicts are usually self-perpetuating through communications channels, even if the problem originated elsewhere.

### Approaches to Conflict

Approaches to conflict resolution fall into two general categories: direct discussions between groups involved in the conflict and changes to the organization's structure.

Since it is best to learn as much as possible about the problem before devising solutions, the data collecting approaches should be tried first — brainstorming, negotiation and mediation.

In a brainstorming session, representatives from the two groups are brought together by a mediator and are requested to generate as many possible ways to view the problem as they can.

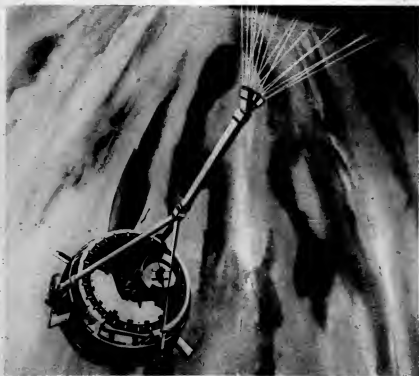
The mediator insists that the ideas be generated without passing judgments on the ideas' validity. This puts the two groups in a situation in which a common goal is required and temporarily eliminates the need to choose "the best" idea.

Later, after the group has developed cohesiveness through this process, efforts continue to select workable ideas from the list.

When groups come to discussion sessions with a win-lose point of view, the group with the greatest power and debating skills wins. The chance for effective compromise decreases significantly.

These negotiation sessions turn into power plays, and one group's cause is forced at the expense of others.

Mediation through the use of a third party can be structured so that solutions are traded without taking



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risks (asking for brainstorming sessions may be viewed by some as a risk).

Because of their similarity, these three approaches can be combined into one general approach, with the variable being whether or not to use a third-party mediator or a group leader.

Some organizations use an outside party as the mediator, such as a consultant. On the other hand, others feel that a manager or other employee outside the sphere of conflict can be an effective mediator.

Such meetings are much more productive when the participants are given an agenda in advance. The mediator can be quite helpful in drawing up that agenda.

A second set of approaches to conflict involves changes to the structure of the organization. The structural change need not be dramatic, but it should constitute an attempt to apply a solution. Solutions are premature if the problem has not been properly diagnosed.

Organizational approaches to conflict include the following:

1. **Issuing a management order.** While it is not always feasible or desirable to issue a managerial directive to resolve the problem, competitive struggles and ambiguous role conflicts are often the result of the lack of a clear statement from management.

2. **Reducing group interdependence.** Reducing the interdependence between departments is a possible structural method for dealing with the conflict, but it is often expensive. The cost is high because redundant work cycles may be created, with a corresponding growth in expenditures for personnel and overhead.

3. **Merging the conflicting groups.** Merging the departments under one overall authority may result in directing the goals of the two groups away from competitive activities and toward more cooperative efforts.

In this situation, though, the conflict may resurface later in another form. It is rare that an organizational change can completely resolve conflict, unless ambiguously defined responsibilities were at the root of the conflict at the beginning.

4. **Buffering intergroup activity.** Buffering the interaction between departments is sometimes possible when the output from one department becomes the input for another. This typically requires rescheduling output cycles. If time pressure has

been placed on a group to implement new or revised systems, but the implementation must wait for certain paperwork to be completed in another group, these two groups are interdependent.

Scheduling changes and formal notification may help make it clear that all paperwork must be completed by a certain date so that implementation is not delayed.

5. **Using a coordinator.** Appointing a coordinator (one individual) to

act as a go-between for the two departments is a highly successful technique for resolving intergroup conflicts. The candidate for this position may require special interpersonal qualities, however, to handle the conflicts efficiently.

6. **Creating an integration group.** Creating a formal integration group that coordinates the efforts of the two departments is a more sweeping method of resolving intergroup conflict.

These last two solutions have had the greatest success of the changes to structure.

Managers need to develop skills in recognizing and evaluating conflict and the potential for conflict. DPs, in particular, tend to focus on technical problem solving at the expense of interpersonal issues.

A better understanding of group interaction will help put a lid on conflict and boost efficiency in their organizations.

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#### About the Author

Stephen F. Jacobus is administrator of the Employee Assistance Program at Dun & Bradstreet Operations in Berkeley Heights, N.J. He has 17 years' experience as a consultant/writer and psychologist with such organizations as IBM, Honeywell, Inc., National CSS and the U.S. Army Electronics Command.

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## For Workmen's Comp Division

# File System Frees Group's Paper Logjam

SALT LAKE CITY, Utah — Lani Moffat used electronic filing of microfilm images of department documents here to break up a paper logjam that had her division tied in knots.

Moffat, administrator of the Utah Workmen's Compensation Division, keeps track of records for all state industrial accident insurance claims. Handling hundreds of paper forms on a daily basis, Moffat's department was spinning its wheels with its insurance demands.

"The system was set up in the 1940s by a librarian," Moffat said of the old system. "We had closed files, open files, Supreme Court files, Combined Injury Fund files, [and so on]... The whole thing was just impossible."

So Moffat and her assistant went looking for a computer-based solution. The system that seemed to offer the most promise was an electronic filing system that combined computer and micrographics technologies. It revolved around Eastman-Kodak Co.'s IMT-150 microimage terminal, a Wang Laboratories, Inc. mini-computer and a software package from California Information Processing called Miracle.

The Miracle software is a data base management system that can be customized for the user's particular needs, according to Moffat. This enabled her division to retrieve and reference files easily, she said, and eliminated all the duplicate information that so weighed down their operations.

"It was the first demonstration we'd seen that worked," Moffat recalled of their search. "At most others, we found something that didn't fit in well with our plans."

The system has also been easy to cost-judge, Moffat said. With the installation of the system and revisions in procedure, the division has been able to handle increases in filing claims between 15% and 75% with no increase in staff, according to



Personal data is entered at Utah Workmen's Compensation Division.

Moffat.

"It used to take a clerk eight hours each day to file the 300 to 500 incoming medical reports," Moffat said. "Now that same clerk finishes those reports in just two hours," with the help of the Kodak Record Reliant 750 microfilm.

Subsequently, service has been greatly

enhanced, she continued. "The whole point of workman's comp insurance is to give the injured worker a speedy remedy," which the system has helped them deliver.

Another added benefit of the system's improved efficiency: after clearing  
(Continued on Page 66)

## Storage Systems Said to Increase Series 1100 Processing Power

BLUE BELL, Pa. — Sperry Univac has unveiled two semiconductor-based storage systems that reportedly significantly increase the processing power of the company's Series 1100 line.

Configurable as either a single- or dual-channel subsystem, the Semiconductor

Auxiliary Storage (SAS) device's data is accessible in less than one millisecond, which the company claims is "thousands of times faster than was previously available in rotating storage devices." A spokesman noted that one of the unit's cabinets is capable of storing a minimum of 917,000 words and is expandable up to 3.6 million words.

The spokesman added the SAS is ideally suited for users continually accessing files such as rate tables and directories for data bases.

The second storage system is dubbed the Medium Performance Cache/Disk, which contains either one or two Type 5057 cache/disk processors with one cabinet of semiconductor storage. In this mode, according to the company, the storage is used as a cache to store data requested from the vendor's Models 8450, 8470 or 8480 disk drives.

Explaining how the device operates, the spokesman said the original request for data is transferred directly to the CPU. While that transfer is taking place, that same data, as well as adjacent information, is being stored in the cache. Consequently, subsequent service calls can be made to and from semiconductor storage without the delays inherent in reading/writing to movable-head magnetic units, he explained.

Purchase prices of SAS range from \$46,290 to \$104,700, depending on configuration. The Medium Performance Cache/Disk carries a \$103,150 price tag. Under the terms of a five-year leasing agreement, users can lease the two products for as low as \$927/mo and up to \$2,105/mo, the spokesman said.

Both products are scheduled for an April release, the vendor said from P.O. Box 500, Blue Bell, Pa. 19424.

## Utilizes Back-End Processing

# High-Speed DBMS Introduced

BATAVIA, Ill. — Univac Computer Corp. has introduced a high-speed data base management system (DBMS) that utilizes back-end processing and Bell Laboratories' Unix System III software combined

with a Digital Equipment Corp. VAX-11 computer.

The host processor may be any member of the DEC VAX-11 series, a spokesman said. DBMS functions are carried out by the back-end processor, a Britton-Lee, Inc. Intelligent Database Machine (IDM). The IDM includes a Zilog, Inc. Z8000 processor with resident relational data model software, high-speed error check and control memory and storage module drive disk controllers with random-access memory. An optional "data base accelerator" can be added to increase processing speed. The system supports up to 64 host processors, the spokesman said.

The processors are integrated via Unibase, which runs under Unix System III and includes several levels of data management support. They include physical interconnect and network protocol between the host and back-end processors; embedded and interactive intelligent data languages; data base maintenance utilities; nonprocedural report writer and a data entry package for screen-formatted entry and data type checking.

Prices start at \$120,000, including a VAX-11/730, IDM 200, Unibase software and 100M bytes of disk storage from 25 S. Water St., Batavia, Ill. 60510.

## Micro Link Out For T/S Service

AMARILLO, Texas — Corporate Systems, Inc. has announced a microcomputer link to its mainframe-based risk management time-sharing service.

Called CS Micro, the risk management service allows managers and safety directors to obtain summary of their firm's risk management data, the vendor said.

For \$250/mo over a three-year period, the firm will equip users with either an Apple Computer, Inc. Apple III or an IBM Personal Computer. The processors are equipped with a printer and modem. Use of the data base is billed separately on a volume basis.

The vendor can be reached through P.O. Box 3180, Amarillo, Texas 79120.

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## Controls Multiple Screens

# Terminal I/O System Unveiled

PROVIDENCE, R.I. — PL Systems, Inc. has unveiled Datatouch, a touch-sensitive terminal I/O system that can be configured to control any number of screens and can operate from a user's host computer, the vendor said.

The system reportedly can control terminals to display graphics such as floor plans, charts and maps in either single-color or multicolored

images.

The data base is expandable and an optional built-in printer can provide an instant printout of data from the terminal, according to the vendor.

The system describes services and facilities, gives directions, costs and locations; provides schedule lists; and gathers marketing data from multiple-choice questions.

A complete system, including a microcomputer and screen terminal, is \$8,500. With the optional printer, the package costs \$10,000, a spokesman said. PL Systems is located at 222 Williams St., Providence, R.I. 02906.

## Controller Introduced

HILLSBORO, Ore. — A module said to enable electronics manufacturers to plug a graphics display capability into such products as personal computers and industrial automation terminals has been announced by Intel Corp.

The iSBX 275 video graphics controller (VGC) is a 3-in. by 7-in. device that maintains and displays eight-color data on a raster screen and draws such elements as lines, arcs and circles.

The unit is the latest in a series of Multimodule circuit boards to plug into 8- or 16-bit Multibus (IEEE 796) data pathways (buses), as well as other systems compatible with the iSBX bus, according to the vendor.

The iSBX 275 costs \$995 from 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97123.

## Converter For Micros Announced

NASHUA, N.H. — A desktop media converter said to allow 20 leading models of word processors and personal computers to become diktate-compatible with one another has been introduced by Itel Corp.'s Composition Systems Division.

The Converter reportedly allows users to key material on one system, store it on 5¼-in. or 8-in. diskettes and load it into the Converter, which is attached to another word processing workstation.

Transfer is made at speeds of up to 10,000 characters in under 11 seconds. Data is transferred asynchronously using a TTY-style protocol over RS-232-compatible data lines.

The Converter, with two translation programs, costs \$11,500. Additional units can be purchased for \$800 each, with OEM discounts available.

More information can be obtained from the firm's OEM Systems Group, located at 34 Cellu Drive, Nashua, N.H. 03063.

## "Hyatt was a pioneer of local area networks. When Datapoint introduced the first one, we ordered."

—Bob Regan  
V.P. Management Information Systems  
Hyatt Hotels Corporation



"Local area networks are the hot topic in data processing these days. But they're making new to us," says Hyatt's Bob Regan. "Ours have been up and running for five years."

"When Datapoint introduced the first local area network, the ARC system, in 1977, Hyatt was among the first to install it. Today there are approximately 5,000 ARC local area networks in use, far more than any competing system."

"One reason the ARC network has been so effective for Hyatt is because it's easy to expand," says Regan. "Hyatt has had phenomenal growth, and the ARC has kept up. When more people needed the system to do more work, we simply added to the network."

The ARC local area network can be expanded virtually without limit by simply plugging in additional Datapoint processors, printers, storage disks, and terminals. Each new processor adds power to the

network so new users get the same fast response the original users were getting. Companies can easily match the power of an ARC system to their needs, expanding in small, inexpensive increments instead of buying "more computer than they need" in order to leave room for growth.

"What's more, Datapoint systems can be expanded or upgraded without replacing software. "We run some programs on ARC networks that were originally written for our first Datapoint computer more than ten years ago," says Regan. "That means we didn't lose any of the money we invested in programming and training. And it made the growth steps easy on our people. The changeover to the ARC network was accomplished in only two days."

No matter how far an ARC system is expanded, all the users can have access to all the data except where security precautions are installed. So even though more and more people are using more and more computers, there's never a

need to duplicate files.

"At present, Hyatt operates forty-five ARC systems," Regan says. "Others are in the planning stages right now. On the operations side we use them for accounting, reservations, and group sales. At Corporate we use them for accounting and for systems development. Obviously, we depend on them heavily. They're like the system where we check our own financial performance. They simply have to work. And they do."

"Hyatt has stayed with the ARC system because it's been cost-effective. That's the bottom line. I can reconfigure a certain system in a hotel, but in the end, the system has to sell itself. And keep selling itself after it's installed. Our Datapoint ARC systems have done that."

For more about Datapoint, call (800) 531-6629, In Texas, call (659) 292-5099. Telex 707300 in the US; 06966222 in Canada; or 063494 in Europe (UK). Or write Datapoint Corporation, Marketing Communications 741CW, 9735 Datapoint Drive, San Antonio, Texas 78204.



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## Tabor Unveils Microfloppy Drive

WESTFORD, Mass. — A single-sided microfloppy disk drive that uses a 3½-in. flexible diskette has been introduced by Tabor Corp. Called the TC 500 Drivette, the Tabor unit reportedly offers the same 500K-

byte storage capacity of standard 5¼-in. floppy drives, but at a quarter of the size, half the weight and 60% of the power. The Drivette is plug-compatible with 5¼-in. drives. The media format — 140 track/in., 80 track/

side — makes it compatible with 5¼-in. drives as well, the vendor said. Major drive components include a direct-drive spindle motor, custom read/write electronics and large-scale integrated control logic, all built into a one-piece die-cast chassis, the vendor said.

Dynas Corp., Brown Disc Corp., BASF Systems Corp. and 3M Co. are all committed to providing 3½-in. media for the Tabor drive, according to the vendor.

Evaluation units are priced at \$315 each. Tabor is located at Lyberty Way, Westford, Mass. 01886.

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## Financial System Debuts From Casi

LOS ANGELES — Custom Application Systems, Inc. (Casi) has developed a new interactive computer system specifically designed to handle the complex reporting and monitoring requirements associated with asset-based lending and commercial loans.

The CLF/3000 system is available as a complete system using either the Hewlett-Packard Co. HP 3000 series computer or the software that is available separately.

CLF/3000 reportedly can be used as a stand-alone system for a single location or can be used in multiple locations as a distributed data processing system.

The system uses a centralized data base and single data entry format, prevents data redundancy and was designed for accounts receivable, inventory, special-term and participation loans.

Other features include the ability to update the data base on-line in real-time as soon as an entry is completed, an inherent security system, a remote spooling/printing capability that supports multiple locations and a simplified means for adding custom features.

CLF/3000 costs \$55,000, a vendor spokesman said from Casi, located at 1888 Western Park E., Los Angeles, Calif. 90067.

## Refurbishing Service Rebuilds Disk Packs

SANTA MONICA, Calif. — International Memory Products of California, Inc. is offering a refurbishing service for disk packs.

The vendor claims it can refurbish any vendor's rigid disk pack or cartridge, regardless of size or age. It guarantees a refurbished disk for seven years.

The service costs from \$40 for relatively simple disk packs to \$495 for more complicated 300M-babyte disk packs, the company said from 3017 Ocean Park Blvd., Santa Monica, Calif. 90405.

## Cartridge-Based Streaming Tape System Out

HAUPPAUGE, N.Y. — A ¼-in. streaming tape system that operates at speeds up to 90 in./sec and has a data transfer rate of up to 72K byte/sec has been unveiled here by the Qantex Division of North Atlantic Industries, Inc.

The Streamer 410 is a cartridge-based system that stores a minimum of 45M bytes of formatted data on a cartridge, according to a spokesman for the vendor. Its two-channel bidirectional tape head with a separate erase bar reportedly records data on

eight tracks, the spokesman said.

Tracks are accessed by moving the tape head in small increments with a stepper motor to achieve accurate track positioning, the spokesman explained.

The Streamer 410, including controller, is priced at \$1,625. Further details may be obtained from the vendor at 60 Plant Ave., Hauppauge, N.Y. 11788.

## Disk Subsystems Get Controllers

FULTON, Calif. — The 11 Connection, Inc. has expanded its line of disk subsystems with disk controllers designed to support Digital Equipment Corp. Q-Bus and Unibus systems.

Manufactured for the firm by Micro Technology, Inc., the controllers are aimed at users of DEC's LSI-11 and PDP-11 processors. The controllers allow users of LSI-11 and PDP-11 systems to use 11 Connection's table-top slim-line disk subsystems, according to the vendor.

The subsystems can support two slim-line 8-in. floppy disk drives or a single full-size disk drive. Single- or double-sided drives can be used, the vendor said.

Disk subsystems cost from \$1,800 for a single-sided floppy disk subsystem. The vendor can be reached through P.O. Box 249, Fulton, Calif. 95439.

## Electronic Filing Frees Logjam

(Continued from Page 61)  
through the division's backlog of work, it found approximately 20 cases of pending orders and pending orders written on them. The Second Injury Fund is financed in part by money that carriers pay into the fund when there is a fatal on-the-job injury not involving dependents. "So we were able to collect from \$225,000 to \$304,000 for that fund in one day by simply gaining the time to go through files and pull those cases," Moffat related.

Furthermore, Moffat has plans for the system in the future. The data base, information available in the data base, she feels that it must be possible to develop a statistical program that will analyze how long it takes to go through all the processes that are a part of handling claims and to develop standards from that information. She thinks that such information would allow the legislature to draft laws to improve further the handling of workmen's compensation cases.

## Course Creator Aid Out From CDC

MINNEAPOLIS — Control Data Corp. has released a packaged hardware/software configuration that is said to enable authors who are not trained programmers to create computer-based courses.

The Plato Author System consists of a fully configured CDC 110 microcomputer and offers two major courseware options. The first, PCDI (Plato Courseware Development), enables the user to develop and deliver courses completely on the micro. The

option provides a tutorial lesson model, a drill and practice model and a situation simulation model, according to a CDC spokesman.

PCD2 (Plato Courseware Development and Delivery) enables on-line development for both on-line and micro-delivery. Micro executors for the Apple Computer, Inc. Apple II and the Texas Instruments, Inc. 99/4A will be available in May; an IBM Personal Computer executor is to be released in September.

## Okidata Adds Two Models To Dot Matrix Printer Line

MOUNT LAUREL, N.J. — Okidata Corp. has enhanced its Microline 84 dot matrix printer line with the addition of two models.

### Printer Out From Iquad

LOCUST VALLEY, N.Y. — Iquad Co., Inc. has unveiled a daisy-wheel printer reportedly capable of speeds up to 65 char./sec.

Unlike other daisy-wheel printers, the Iquad printer carriage mechanism has no ribbon motor, wheel motor, ribbon cartridge or encoder to encumber its movement, a vendor spokesman said. This product can handle either anifold paper tractor-feed from the front or bottom, or cut sheets fed from the top of the unit.

The Iquad printer is priced under \$1,000, according to the spokesman. More information can be obtained by contacting the vendor, located at Duck Pond Road, Locust Valley, N.Y. 11560.

## Controller Announced

GARDEN GROVE, Calif. — A disk controller that is said to interface one or two 5¼-in. Winchester disk drives with Digital Equipment Corp.'s LSI-11, LSI-11/2, LSI-11/23 and LSI-11/23 Plus microcomputers has been announced here by Distributed Logic Corp.

Designated the DQ614, the controller operates directly from the 8-bit bus without additional boards and emulates up to four disk drives, according to a vendor spokesman, facilitating formatted capacities to 41.6M bytes.

The DQ614 disk controller is priced at \$1,695, the spokesman said. Distributed Logic is located at 12800 Garden Grove Blvd., Garden Grove, Calif. 92643.

tion of two models.

The Step 2 systems feature full compatibility with Micropro International Corp.'s Wordstar and VisiCalc software, the vendor said. Other improvements include a switch-selectable interface, select/delete control, a Spanish character set and forward-feed superscript/underscore printing.

Pricing starts at \$1,395 on Step 2 systems. Additional information can be obtained from Okidata at 111 Gaither Drive, Mount Laurel, N.J. 08054.

## Unit Bows For S-100 Bus

GARDEN GROVE, Calif.

An error-correcting, microprocessor-based hard disk controller, board has been added to Advanced Digital Corp.'s line of S-100-based products.

The Model HDC-1001 reportedly provides the S-100-based computer user with a controller capable of operating up to four 8-in. or four 5¼-in. hard disk drives. Its error-correcting capability includes a 32-bit computer-generated polynomial, which reportedly detects and corrects errors before the user is even aware of them. Prices for the product start at \$500.

In a concurrent announcement, the vendor unveiled a Super Slave processor that reportedly provides a dedicated CPU for each user without putting limitations on system size.

Designed to fit in any S-100 bus motherboard, the Super Slave is said to share data with the host system only when accessing the drives or other common peripherals. It comes with its own memory, a Zilog, Inc. Z80A processor and I/O ports. This product costs \$650. Advanced Digital is located at 12700 B Knott Ave., Garden Grove, Calif. 92641.

ber. The option includes Summagraphics Corp.'s Quickdraw and Bit Pad One graphics tools.

The Plato Author System starts at \$20,000 from 8100 34th Ave. S., P.O. Box 0, Mail Station HQA021, Minneapolis, Minn. 55440.

## Layout Model Available

WEST BABYLON, N.Y. — A three-dimensional layout model for data centers is available from Modulex, Inc. Modules, boards and components reportedly allow personnel working in a data center area to predetermine equipment location. Areas

can be designated for service clearance, offices and control areas. Kits consisting of components to lay out from 15,000 to 40,000 sq ft are available starting at \$425 from the firm at 101 Alder St., West Babylon, N.Y. 11704.

## Z-89 Desktop Price Trimmed 20% by Zenith

GLENNVIEW, Ill. — Zenith Data Systems Corp. has cut prices by 20% on its Z-89 8-bit personal desktop computer, which will now sell for \$1,999.

Included with this micro-

computer is either the Digital Research, Inc. CP/M operating system or Zenith's Hdos operating system, and Microsoft, Inc.'s Basic and Sorcim Corp.'s Supercalc electronic spreadsheet software, the vendor said. It also comes with a built-in video display and 5¼-in. floppy disk with 100K bytes of storage. The unit has three serial I/O ports, external disk drive ports and 48K bytes of random-access memory, expandable to 64K bytes.

The vendor is headquartered at 1000 Milwaukee Ave., Glenview, Ill. 60025.

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About the Author William S. Husband  
President of 20th Century Systems is considered by many to be a leading expert in the field of computer acquisition and disposition planning. Formerly in sales with IBM, he has negotiated over 100 3rd Party Leases during an eight year period with the nation's largest lessor of IBM computer systems. Many disclosed his original forecast, made in 1981, of the 3083 introduction in 1982 and rapid fall in resale values for the 3033, until recently. He is used as a consultant in technology planning by major corporations in the U.S. and Canada.

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## Diskstor-Q Micro Based Around DEC 11/23 Q-Bus

WALTHAM, Mass. — Comark Corp. has introduced a microcomputer-based around Digital Equipment Corp.'s 11/23 Q-Bus.

The Diskstor-Q is available with a number of combinations of built-in

mass storage: 8-in. floppy disks, 18M- or 36M-byte Winchester disks and 4-in. tape cartridges.

It reportedly features memory management, 128K bytes of random-access memory, a line time clock, two serial communication channels, push/pull forced air cooling, 200W switching power supply and 18 dual-slot Q-bus card cage. All peripherals are compatible with DEC RT11 and RSX11 software, a spokesman for the vendor said.

Pricing on this system starts at \$7,485, Comark said from 257 Crescent St., Waltham, Mass. 02154.

## Storage System Thwarts Erasures

COLUMBIA, Mo. — Discwasher has introduced a floppy disk storage system said to thwart most accidental erasures and provide a safe means of transporting disks through the mail.

The Discwasher Shielded Floppy Disk Storage System is a three-sectioned folder offering storage for two or four disks as well as the firm's Disk Drive Cleaner.

Designed to shield disks from magnetic fields of up to 500 gauss, the Discwasher is available in three models: one for 5¼-in. disks (\$9.95), another to store two 8-in. disks (\$9.95) and the last for two 5¼-in. disks (\$7.95).

The vendor is located at 1407 N. Providence Road, P.O. Box 6021, Columbia, Mo. 65205.

## Workstation Out For CAD/CAM

WALTHAM, Mass. — Rangleine Corp. has introduced a computer-aided design and manufacturing (CAD/CAM) workstation for drafting and storing CAD/CAM applications.

The CAD/CAM Workstation is housed in two cabinets and is comprised of the workstation unit, a terminal stand and a drafting board, the vendor explained.

This product sells for \$2,900. Further details are available from the vendor at 14 Felton St., Waltham, Mass. 02154.

## Quadmaster Diskette Out for IBM Micros

NORCROSS, Ga. — Quadmaster Corp. has announced the Quadmaster diskette, which is said to cut the running time of computer programs by 80% or more.

It is usable only with IBM Personal Computers equipped with Quadboard, the firm's four-function Personal Computer expansion card, a spokesman said. Quadmaster, with its Quadram Drive, costs \$19.95.

The diskette is free with the purchase of Quadboard, which is priced from \$95 to \$995, according to the spokesman. Quadram can be contacted at 4357 Park Drive, Norcross, Ga. 30093.

## Interface Card Targets Apples

TUSTIN, Calif. — Wespercorp, Inc. has announced an intelligent printer interface card for attaching parallel printers to Apple Computers, Inc. Apple II and Apple II+ processors.

Called the Wizard-IFI, the unit reportedly gives parallel printers additional features including variable line length, left and right margins, page length, perforation skip, text screen dump and block graphics, the vendor said.

The unit mounts inside the processor and can be used with most Apple II expansion boards. The Wizard-IFI costs \$87.50, the vendor said from 14321 New Myford Road, Tustin, Calif. 92680.

## Optical Scanner Introduced

MINNEAPOLIS — An optical scanner that reportedly interfaces with any microcomputer, minicomputer or mainframe that supports asynchronous communication has been introduced here by National Computer Systems, Inc.

The Sentry 3000 changes pencil markings on a form into computer-readable data, according to the vendor. Its applications include testing, inventory control, surveys, order entry, sales calls and time reporting. The Sentry 3000 reportedly reads both sides of a page simultaneously and can operate at speeds of 600 sheet/hr. the vendor said.

This product is priced at under \$3,000, the vendor said from 4401 W. 76th St., Minneapolis, Minn. 55440.

## Researcher Tells OAC '83

# Workstations of Future to Hear and Talk

By Jim Bartimo  
CW Staff

**PHILADELPHIA** — As office workstations become more sophisticated, they will hear, see and talk with the user, according to Howard Morgan, a researcher at The Wharton School, University of Pennsylvania.

Morgan spoke here last week on "Advanced Workstation Concepts" at a session of the Office Automation Conference (OAC '83) sponsored by the American Federation of Information Processing Societies, Inc.

"In the next three to five years, we'll

see the true integration of voice technology," Morgan said, because, when all is said and done "voice is the dominant means of communication."

There are two ways this will come about, Morgan predicted. One method will integrate current telephone service with the stand-alone workstation, as has been done with the Grid Systems Corp. Compass and the Digital Equipment Corp. Professional microcomputers.

The second method will integrate voice recognition into the terminal, as Texas Instruments, Inc. has done with its newly announced Professional personal comput-

er. However, before this method is successful, designers of workstations will have to make continuous voice recognition the standard, eliminating the need to pause after each word for the computer's sake, Morgan told the attendees of the OAC '83 session.

Predicting that vision technology will be suitably sophisticated by the late 1980s, Morgan predicted that a lens will watch the user for signs of body language, such as a grimace or a smile. "Vision systems will pick this up just as HAL did in the

(Continued on Page 72)

## Two Modular WP Systems Introduced for Edit Pak Series



Technology International's Edit Pak System III

**ORLANDO, Fla.** — Technology International Corp. has introduced two modular word processing systems, one of which can be purchased as a stand-alone or as an upgrade to the company's Edit Pak System I word processor.

The Edit Pak System II features 64K bytes of working memory, document-oriented storage and retrieval, a 12-in. monitor, a 40 char./sec. letter-quality, daisy-wheel printer, a double-sided and double-density disk drive and a CP/M operating system from Digital Research, Inc. The Edit Pak System III features a double disk drive that can be expanded to include a Winchester hard disk, according to a vendor spokesman. The clustering capability of both systems prove useful for

multitasking users, the spokesman said.

The Edit Pak System II is available for \$5,995; the Edit Pak System III costs \$6,495 from Technology International, 9715 S. Orange Ave., P.O. Box 13457, Orlando, Fla. 32839.

### Sold in Separate Modules

## Integrated OA System Debuts

**ARLINGTON, Mass.** — Micro Architect, Inc. has announced an integrated office automation system (IOAS) consisting of a data base manager (IDM-X), an application system (Exec) and a word processor (Word-X) for IBM or IBM-compatible per-

sonal computers using Microsoft, Inc.'s MS-DOS operating system.

IOAS is sold in separate modules so that the user does not have to pay for modules that are not needed. The system requires a dual disk storage or hard disk, a CRT, 64K bytes of memory (96K bytes for the word processor) and a 132-col. printer.

Modules are priced as follows: \$198 for Exec-I, an executive information system consisting of seven applications; \$398 for IDM-X; \$198 for Screen Writer, and \$98 for Word-X, with full-screen editor. Planned modules include graphics and a Visicorp Visicalc spreadsheet interface.

Micro Architect is located at 96 Dothan St., Arlington, Mass. 02174.

## Info-Text Targets VAX-11 Series

**WALTHAM, Mass.** — Henco Software, Inc. has announced a document retrieval and text management system for Digital Equipment Corp.'s VAX-11 series.

An extension of Henco's Info, Info-Text is also a relational data base management system that is reportedly able to join up to 10 different files. It can be broadly applied to retrieve structured information from departmental computer data files such as departmental data bases and free-form text from word processing files. The system merges selected information into one concise format for review, analysis and update, the vendor said.

The system was designed for applications in which specific information from multiple document sources must be located and consolidated on short notice for problem solving and reporting.

Info-Text uses host system data file structures and standard ASCII text files.

Other features include free-text query facilities, a full-screen text editor, an optional industry-standard word processor and interactive file creation.

It costs \$20,000 and requires Info, costing \$14,700, from Henco Software, 100 Fifth Ave., Waltham, Mass. 02154.

## WP Package Tied to Basic Four

**ALBUQUERQUE, N.M.** — MAI/Basic Four Business Products Corp. has announced a word processing package that is compatible with its S/10 line of small business systems.

Fully compatible with the word processing system used on Basic Four's Office Management System, the S/10 word processing package can be used in a distributed or stand-alone environment.

Features of the system include the ability

to transfer documents from the S/10 to larger Basic Four systems, an electronic filing interface, full mathematical functions and keyboard storage and recall. The system also allows random page and line access and automatic headers and footers, the vendor said.

The package costs \$695. An S/10 with 612K bytes of disk storage costs \$4,995.

The vendor is located at 601 San Pedro N.E., Albuquerque, N.M. 87108.



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## Workstations of Future to See, Talk

(Continued from Page 69)  
movie (2001: A Space Odyssey), Morgan said.

But perhaps the most significant change in workstations will be the advance of user interfaces. "In overall architecture, there are two words that keep coming up," Morgan said — "consistency and integration."

In order for users to use any workstation without retraining and for every workstation to integrate the many

aspects of office information, interface advancements will take place in natural languages such as English, structured query languages and graphics, according to Morgan.

Pointing to how readily a bank customer will learn to use an automatic teller machine if he is out of money on a Saturday night, Morgan said, "People will learn to use interfaces if the product or service is useful to them."

Most of the advancements in the workstation will take place because of the dropping price of memory. "Designers knew they were making the early machines difficult to use," Morgan said, "but there was no room in the memory. Humans had to make up for what the computer could not do."

Workstations that use "windowing" to allow users to look at more than one file at once are workstation advancements, Morgan said. This capability came about because "designers finally realized that one sheet of paper scrolling up and down wasn't an accurate representation."

## Wang DVS Gets Update

(Continued from Page 69)  
one to deposit voice messages for DVX subscribers.

The DVX Feature Package also includes name confirmation for message senders and recipients, broadcast and blackout capability, nonuser information alert, management statistical tracking and an optional message-waiting notification terminal.

In addition, Wang announced its commitment to provide a networking capability that will connect multiple and remote DVXs together to form a single voice messaging system.

Enhancement prices are \$54,000 for the DVX Option, which supports up to 250 users and is available in May. DVX with word processing, which includes the DVX Feature Package with a Message Management System, is available in 12 different models, with prices ranging from \$119,300 to \$248,000. More information is available from Wang, 1 Industrial Ave., Lowell, Mass. 01851.

## Easy Text Out For System/34

ROCKPORT, Mass. — Para Research, Inc. has introduced a word processing package for the IBM System/34.

The reportedly user-friendly Easy Text is said to tabulate up to seven columns of text or data, create lines or formats up to 132 col. wide, move or copy paragraphs and append paragraphs, the vendor spokesman explained.

Documents can contain up to 3,000 paragraphs or 99,000 lines. Easy Text needs 40K bytes of memory to run.

Easytext costs \$750, the spokesman said.

Para Research is located at Whistletop Mall, Rockport, Mass. 01966.

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# Reshuffling at IBM Stresses Marketing



John Akers — People-Oriented

By Bill Laberis  
CW Staff

The recently announced top management reshuffling at IBM represents a continuation of a corporate reorganization launched three years ago, rather than a harbinger of changes in market or product strategy.

## Analysis

That reorganization was initiated by the seven-member corporate office — the de facto power base at IBM — when Frank T. Cary handed over his duties as chief executive officer (CEO) to John Opel in March 1980. It was Cary and Opel who, in the last few years, boldly vaulted IBM into

(Continued on Page 76)



John Opel — Chairman and CEO

## Separate Units Required?

# AT&T Subsidiary Battle Looms

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Whether AT&T should be required to market terminal equipment and enhanced — that is, computer-based — on-line information services through a separate subsidiary was presumably answered two years ago by the Federal Communications Commission (FCC) in its Second Computer Inquiry Decision. But now the whole issue has re-emerged and is rapidly becoming the focus of a major battle.

Although the battle is mainly among competing suppliers, the outcome is likely to affect both the price and availability of many on-line products and services.

The need for a separate subsidiary has come up again partly because of Judge Harold Greene, who presided over the government's antitrust case against AT&T. Last year, Greene said the 22 Bell operating companies to be divested by AT&T early next year can market terminal equipment.

Greene did not say, however, whether the operating companies must first form separate subsidiaries. The FCC's 1980 Computer II decision requires separate subsidiaries, but this provision applies only to AT&T, not to the operating compa-

nies after they become independent carriers.

To resolve this uncertainty, the FCC last month requested comments from interested parties on whether the operating companies should be required to market terminals, enhanced services and cellular communications — a new form of mobile radiotelephone service — through separate subsidiaries. At approximately the same time, the commission decided that Cincinnati Bell Telephone Co. and Southern New England Telephone Co., which will not be divested by AT&T, can offer

(Continued on Page 74)

## R&D Partnerships Offer Alternatives

By George J. Yost

Special to CWI

A relatively simple structure has emerged as a financing vehicle for high-technology companies, especially software houses. Called the research and development (R&D) partnership, the vehicle should be viewed as an alternative financing tool considered alongside other external capital sources.

The R&D partnership is formed to finance a specific research project of an existing company. The partnership is com-

(Continued on Page 78)

## Management Shakeup at Tandem

By Robert Butt

CW West Coast Bureau

CUPERTINO, Calif. — Michael Green, co-founder of Tandem Computers, Inc. and senior vice-president, has left the company amid a major management reshuffling.

Together with announcing that Green has retired to pursue personal interests, the company also announced the departure of Charles Ryle, vice-president of U.S. marketing. Ryle said he was leaving Tan-

dem to look for a job in a start-up company.

Green joined the firm as vice-president of software development and held that position until April 1980. Since then, he has been involved with special projects, reporting to the president. Tandem says it has no plans to fill Green's position, since the projects were essentially short term and had been largely completed at the time of Green's departure.

(Continued on Page 82)

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COMPUTER INDUSTRY

## AT&T Still Battling Separate Subsidiary Rule

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Ever since the Federal Communications Commission issued its Second Computer Inquiry Decision in December 1980, AT&T has been trying to kill the separate subsidiary requirement.

That campaign began in earnest last year, when various AT&T officials, in testimony before Congress, said it effected that the phone company was being discriminated against because it alone was required to establish a "separate subsidiary" to market terminal equipment and enhanced services.

The present phase of this campaign began late last year, when AT&T filed the first of a series of pe-

titions seeking waiver of the separate subsidiary rule to let the Bell operating companies or AT&T's Long Lines Division offer competitive products directly.

So far, the commission has waived the rule in one case — thereby allowing Bell operating companies to market terminals directly to physically handicapped customers — and refused to waive it in another — thereby preventing Teletype Corp., an "unseparated" AT&T subsidiary, from marketing terminals to domestic end users.

But three other waiver petitions are pending before the commission. One seeks permission for AT&T Long Lines to provide terminal equipment to the Department of De-

fense and certain federal civil preparedness agencies. Another wants "Computer II" amended so that Bell operating companies can market

communications network.

In the argument over receive-only earth stations, AT&T has said that they must be offered on a regulated basis because this would allow for more efficient testing and maintenance. This is one of the major justifications AT&T has advanced for the channel service units and, as IBM pointed out earlier this month in a comment on the receive-only earth station waiver petition, the same argument was used by AT&T several years ago when it argued that every telephone subscriber should be required to lease one set from the telephone company.

The commission rejected this "primary instrument concept" then, but it remains to be seen whether history will repeat itself.

Centrex equipment directly. The third petition requests the commission to let AT&T offer receive-only earth stations directly.

Underlying this latter petition is an issue that impacts data communications users directly. For a long time, the phone company and its competitors have been arguing about whether AT&T needs to own the user interface to its nationwide com-

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CW 3/7/83

## AT&T Waging Subsidiary War

(Continued from Page 73)

terminals and enhanced services directly rather than through separate subsidiaries.

Last year, the FCC decided both companies would have to establish separate subsidiaries, but the ruling was deferred to allow time for the impact of the AT&T divestiture to be considered.

This month, the commission said that separate subsidiaries would not be required — partly because divestiture "will clearly eliminate AT&T's bottleneck" control over local exchanges and partly because neither Cincinnati Bell nor Southern New England Telephone has enough market dominance to have a separate subsidiary necessary.

## Dynamic Control, IBM Join With HPMS

WINTER PARK, Fla. — Dynamic Control Corp. announced it has signed a joint marketing and installation assistance agreement with IBM for Dynamic's Hospital Patient Management System, which runs under the IBM System/38.

Under the agreement, both companies will have complementary capabilities to market cooperatively the most current version of the System/38 and hospital package to hospitals throughout the U.S. and Puerto Rico.

Dynamic Control is at 1311 S. Semoran Blvd., Winter Park, Fla. 32792.

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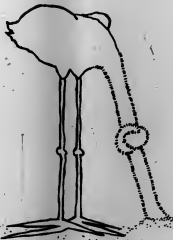


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# IBM Changes Represent Continuation of Plan

(Continued from Page 73)  
new, nonmainframe markets, weathering some stormy financial perfor-

mances enroute.

Now, analysts say, Opel as chairman and CEO will call upon the mar-

keting genius of John F. Akers, newly appointed president, to exploit the markets IBM has penetrated. As one analyst put it, "The company's in good financial health now. Cary's the guy who helped them get there, and now marketing will take over."

If there is genuine excitement in the analyst community about the reshuffling, it is related to Akers' promotion to president. The 48-year-old former Navy fighter pilot is now the heir apparent to the post of chairman and CEO, IBM's top slots. With IBM's "mandatory" executive retirement age of 60 (or so), Akers could eventually match Cary's decade-long tenure in the company's front office.

Akers' greatest challenge for the president's job came from Paul J.

Rizzo, who was elected vice-chairman of the board at the same time Akers was elevated to president.

But at 55, observers said Rizzo may have been a little too old to groom for the chairman and CEO roles. Moreover, Rizzo's background is solidly entrenched in corporate finance in a company that bears a distinct marketing and sales brand.

"IBM has long been known as a sort of Harvard Business School of marketing for the rest of the industry," said Frank R. Gens, senior analyst with the Yankee Group in Boston.

"It's a marketing-driven organization, and the company is particularly poised now for an intense marketing effort, especially in its new areas," Gens continued. "For this reason, I suppose, the word around IBM for the past six months or so has been that Akers is the guy."

As for Rizzo, Gens said IBM "handled the loser quite well" in elevating him to vice-chairman of the board, a position that had been unfilled for over five years. But the Opel-Akers team, Gens said, is best suited to guide IBM's independent business units on a track of sustained growth.

"IBM's [management] is making it clear they want to be No. 1 in each market they're competing in," Gens said.

Jack Hart, IBM analyst at the International Data Corp. in Framingham, Mass., described Akers as "very people-oriented... an outgoing, personable, compassionate guy... compared to the Rizzo reputation of being a hard-nosed, tough and financially oriented type."

Hart added that Akers has managed to avoid the 18 hour/day executive trap, instead finding a way "to balance the requirements of his job with outside needs."

Had Rizzo been named president, Hart said he would have looked for IBM to become even more price and product aggressive than it has been in the last two years. Under Akers' rule, "IBM will re-emphasize what Akers believes, which is that sales and marketing is what the company's all about," Hart said.

Harry Edelson, vice-president of the First Boston Corp., agreed that Akers is "a pure marketing guy," but less well-rounded than either Cary or Opel.

Edelson speculated that the corporate reorganization begun in the late 70s at IBM may have been engineered internally by Akers, who was thus rewarded in part with his recent appointment.

"The company is diversified in several market segments now," Edelson said, "and it needs to go from those new positions with extensive marketing. That's the challenge."



"Memories Are Made of This..."

## EEC Proposals Sent to IBM

BRUSSELS, Belgium — In an effort to end its three-year dispute with IBM, the European Economic Community (EEC) has sent proposals to IBM, giving the company until April 30 to respond.

The proposals are aimed at ending what the EEC has contended is IBM's dominant role in European computer markets. The EEC had sought to force IBM into disclosing certain technical data for new

products at the time of its announcement, rather than when the products are actually shipped [CW, Feb. 28].

IBM has held that such disclosure would allow its international competitors to gain unfair advantage over IBM's copyright designs. The company denied EEC charges that the withholding of technical data has forced its customers to use IBM software.

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## Wins Inquiry by ITC

## Apple Continues Fight Against Counterfeits

By Robert Batt

CW West Coast Bureau  
PALO ALTO, Calif.—Apple Computer, Inc. is increasing pressure on the federal government to halt what it considers to be unfair and illegal competition of computer manufacturers in the Far East.

At the heart of the controversy are alleged counterfeit Apple computers that the company claims are being sold in Hong Kong, Taiwan, Singapore and other countries at prices well below the cost of the genuine product.

Apple has accused certain manufacturers in these countries of infringing its U.S. patents and copyrights and had asked the U.S. International Trade Commission (ITC) to initiate a formal inquiry. Last week, the ITC acceded to Apple's request, voting to launch a formal inquiry to see whether Far Eastern competitors are engaging in unfair international trade practices.

Should the inquiry conclude that imports from the Far East are, in fact, violating U.S. laws, ITC could recommend to President Reagan that the products be excluded temporarily or permanently from the U.S. market.

## Firms Named

Apple has named 22 companies in its complaint to the ITC, mostly small vendors, which it alleges have infringed on patents and copyrights. Three of the companies are U.S.-based and include Formula International, Inc. in Hawthorne, Calif.; North American Research Corp. in Alexandria, Va.; and Collins International Trading Corp. of Encino, Calif. One dealer, Oriental Investments Ltd., is based in Zurich, Switzerland. The rest are to be found in Hong Kong and Taiwan.

"This problem has been going on for about a year," an Apple spokesman explained. "We need to protect our trade rights and make a show of force before more well established manufacturers get into this area, and then we will have a deeper rooted problem."

"The patent area is one that is difficult to enforce internationally," he added. "If the ITC rules in our favor, we hope that will influence other countries who currently allow this illegal trade to exist."

Since Apple first brought its complaint to the attention of U.S. trade officials, between 300 and 500 "fake" Apple IIs and Apple IIIs have been confiscated at U.S. ports of entry, according to Apple.

The company wants the ITC to make a definitive ruling on the patents issue, thereby broadening the grounds on which custom officials can seize suspected products.

Already Apple has brought a number of law suits against manufacturers in Taiwan, Hong Kong, New Zealand and Australia. One company, Sunrise Comput-

ers of Taiwan, is alleged to have sold Apple II computers under the brand name of Apollo.

The trade in counterfeit Apples is flourishing, according to one industry executive who recently visited Hong Kong and who asked not to be named. The Golden Shopping Center in the middle of the colony's congested

Kowloon contains as many as 80 different dealers trading in look-alike Apple computers, he said.

"There are tiny little shops, perhaps no more than 100 square feet in diameter, right next to one another," the executive claimed. "They do a roaring trade, and there is no pretense that the machines are actual Apples. Of-

ten they are sold with no brand name; all the software is pirated and documentation has been translated into Chinese, some of it of better quality than the original."

According to Dan Wendin, associate counsel at Apple, most of the allegedly fake machines in the U.S. find their way into the hands of computer hobbyists.

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# R&D Partnership Emerging as Financing Tool

(Continued from Page 73)  
prised of investors who provide funding, including a general partner whose primary function is the management of the partnership.

Once formed, the partnership pays a software vendor to perform research on its behalf, with the stipulation that any products developed by the vendor belong to the partnership.

In a typical royalty partnership, the vendor is granted an exclusive option to use any technology developed, with the partnership licensing the technology back to the vendor for marketing.

Thus royalty usually takes the form of a percentage of gross revenue derived from the sale of products developed and marketed from the technology.

It is not uncommon for vendors to place a ceiling on the royalty to be paid, allowing the vendor to purchase the technology outright for a lump sum payment. Or in some R&D partnerships, the provision is made for the partners to receive its lump sum payment in vendor stock.

The benefits of an R&D partnership can be substantial, both to partners and the vendor. Assuming certain criteria are met, the partners are eligible for a tax deduction equal to virtually their entire contribution to the partnership, often in the year it is made.

This means that the level of investor funds at risk is limited to 50% of invested capital.

But the most significant benefit for investors results from the corporation's research activities becoming commercially viable. Successful research can generate substantial income for both the investors and the vendor, both in the near and long term.

For the vendor, there is no immediate dilution of equity and usually no loss of control of the company by its founders.

The partnership arrangement may allow the vendor to control better the development and marketing of products developed. And the financial risk of unsuccessful

research is borne by the partnership. It is not borne by vendor.

A variation of the royalty partnership is the equity relationship, in which the partners receive equity in the venture instead of royalty payments. While this partnership offers many of the same benefits as the royalty partnership, such as tax benefits, it also eliminates the investors' ceiling, should products

developed prove successful.

The risks of R&D partnerships to both investors and vendors are also clear. The most obvious is that the research may prove unsuccessful.

And because of the relative newness of R&D financing, there is a risk the U.S. Internal Revenue Service may challenge some of its tax benefits. The contracts, especially those in a royalty part-

nership, are complex, potentially leading to future litigation if the vendor is successful.

For the vendor, the royalty payment is due whether the vendor has the money to pay or not, which may be a problem because it is based on a percentage of revenues and not profits.

And the existence of an R&D partnership may make a second round of financing

more difficult than it otherwise would be.

Thus, the rule for investors and vendors is to weigh the R&D partnership against other financing available and to spell out the contractual details of the arrangement, always keeping a careful eye toward both the near and long term.

Yost is a partner at the accounting firm of Coopers & Lybrand in Boston.



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# DG Wins Contract Award From E.F. Hutton

WESTBORO, Mass. — Data General Corp. has been awarded a strong field of contenders to land a \$40 million information processing system contract from E.F. Hutton & Co. DG will install 300 to 400 of its Branch Information Processing Systems based on its Comprehensive Electronic Office (CEO) and its Eclipse MV/4000 processor.

Other contenders for the contract included Digital Equipment Corp., Wang Laboratories, Inc. and IBM, according to a Hutton spokesman.

The CEO systems will permit simultaneous data base access for information retrieval, nationwide word processing, electronic mail and filing, administrative support for each office and personal computing and decision support applications for Hutton account execu-

tives, DG said.

Each CEO system will also interact with a Bunker-Ramo Corp. System 7/90 used by Hutton account executives for market data, communications and data base inquiry purposes as part of a network controlled by IBM and DG systems.

Commenting on the installation contract, J. David Lyons, vice-president and general manager of DG's In-

formation Systems Division, said, "We believe our past relationship with Hutton, and this agreement in particular, demonstrate the quality and capability of CEO systems, as

well as Data General's ability to provide large information systems users with the appropriate applications solutions to their business needs."

## National Semi Gets Nod From U.S. to Acquire DTS

BOSTON — The U.S. Justice Department has given fi-

nal approval for National Semiconductor Corp. to acquire Data Terminal Systems, Inc. (DTS), ending a month-long discovery period during which the government weighed possible antitrust implications of the acquisition [CW, Feb. 28].

National Semi will pay about \$50 million for the outstanding shares of DTS, a point-of-sale (POS) terminal maker. DTS, a high-growth company until recently, lost nearly \$10 million during the first nine months of 1982.

The acquisition, analysts said, will bolster National Semi's diversification efforts and represents a shot in the arm for the company's systems division, dedicated to the POS equipment for which DTS had become a market favorite before its fortunes began to dip in 1980.

## College Gets Graphics Grant

BOSTON — The Massachusetts College of Art (MCA) has received grants totaling \$69,000 for a pilot program to train graphics artists in the use of computers for design and publishing.

Camec, Inc., manufacturer of electronic composition and publishing systems here, has contributed \$37,000 worth of equipment and personnel to the college. That figure has been almost matched by a \$32,000 grant from Bay State Skills Center.

The pilot program will give 45 artists six weeks of intensive instruction in the operation and use of electronic composition systems.

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In a unit that takes no more space than a daily newspaper, the DN300 gives you a high performance, 32-bit virtual memory processor, high-resolution bit map graphics, and an integrated local area network that provides network-wide virtual memory access.

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The DN300 is fully compatible with Apollo's DN400, DN420, and DN600 color computational nodes and supports the same multiprogramming environment, large virtual address space, network communications, multi-window display management, and extensive command library as other DOMAIN nodes. The DN300 connects directly and easily to any new or existing Apollo DOMAIN network. Or it can be used as a standalone workstation. Which means that you can configure the type of network that exactly suits your staff and working environment.

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DN300 with 3MB memory, 17-inch graphics display,  
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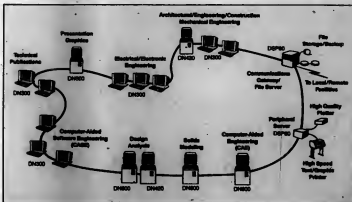
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## Vertical Business Units

## NCR Reorganizes Internally

DAYTON, Ohio — NCR Corp. has announced an internal reorganization in its U.S. Data Processing Group centering on the establishment of four vertical business units, placing an added emphasis on specialized selling by product line.

Each vertical business unit operates as a separate entity and markets company products through a sales and support force. Three of the new units are being established in the Commercial-Industrial/Medical Education Government Division, including the Interactive Systems unit, which sells I-Series products; the General Purpose Systems unit, which sells Y-Series systems; and the Special Purpose Systems unit, which

sells the Decision Mate personal computer. The fourth, ATM Systems, was established in the Financial Systems Division and will specialize in the sale and support of NCR automated teller machine products.

## Comsat Shows Record Earnings

WASHINGTON, D.C. — Communications Satellite Corp. (Comsat) has announced record revenues of \$409 million for 1982, a 23% increase over 1981, and profits of \$43 million, a 53% increase over 1981.

The increases, Comsat said, were the result of growth in sales from the company's international communications satellite services.

## Boston Program Targets DP Literacy

By Susan Blakeney

CW Staff

BOSTON — A computer literacy task force here has developed a proposal for a \$4.7 million project to place computer centers in every one of the city's 124 public schools during the next three years.

Marilyn Gardner, coordinator of

computer programs for Boston Public Schools, led the development team, whose goal is to assure a level of computer-competency throughout the elementary, middle and high school system. At present, 8% of city students at 35 schools have access to computers, Gardner said.

The proposal calls for 15 terminals or stand-alone microcomputers for each school, staffed by teachers from the school system, Gardner explained. Boston teachers are currently being wooed into the computer science domain with 13 graduate courses and various workshops being offered with the help of several local colleges and universities, Gardner added.

The proposal also calls for funding from the School Department, the City of Boston and a number of the high-technology firms located in Massachusetts.

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## Senior VP Green Leaves Tandem

(Continued from Page 73)

Ryle has been replaced as vice-president of U.S. marketing by David Mackie, former vice-president of headquarters marketing. Mackie's former duties will be assumed by Steve Schmidt, director of product marketing.

The management reshuffle comes in the wake of a decision two months ago by another Tandem co-founder, James Katzman, to take a leave of absence from which he has yet to return.

The resignations came when Tandem is seeing some of the worst financial strains it has ever faced. Recent sales and earnings growth have fallen below historically high levels. In 1982, revenues totaled \$312 million, a growth rate of 50% compared with past annual growth rates of between 90% and 100%.

A company spokeswoman denied the management changes had anything to do with Tandem's current financial difficulties. They were "coincidental but not related," she said.

Nevertheless, some industry observers have reached the conclusion that Tandem's "go for broke" growth campaign now needs readjustment.

In announcing a recent restatement of the company's 1982 revenues, which reduced the projected growth rate from 61% to 50% and earnings from \$37 million to \$30 million, James Treybig, company president, said, "Our old practices were designed at an early time in the company's history in a much stronger economy and have not kept pace with the tremendous growth of our business."

"Our reexamination of the year's results convinced us that with its manufacturing plants in Europe and the U.S. a more conservative approach was appropriate," the company president continued.

The slowdown has continued this year. Last month, the company reported that in its first fiscal quarter, ended December 31, revenues grew on an annual basis of 33%, to \$94 million, while profits dropped 9% to \$7.1 million.



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# Hitachi Extends L-Series With Two Processors

NEW YORK — Hitachi Ltd. has extended its L-series of computers with two systems that feature a 16M-byte logical address space that reportedly makes programming and system operation easier for users. The company plans to market both systems in the U.S. eventually, but declined to say when. The systems will be available in Japan beginning in October of this year.

In addition to the two processors, Hitachi made three other introductions, including the following:

- The Virtual Storage Operating System O/Extended System (Voso/ES), which features an enhanced interactive processing function.
- The H-8591-2 disk storage unit, which has a transfer rate of 1,209K

byte/sec.

- The H-8796 facsimile communication adapter, which permits facsimile users to use their equipment as data output terminals.

Through the use of 64K-bit random-access memory chips, the L-450 processor's main memory holds 5M bytes that can be expanded up to 2M bytes. Up to 520M bytes of disk storage can be added to the processor, the company said.

The system can support up to eight workstations in addition to remote workstations and is also field-upgradable to the L-470 system.

The L-470's main memory holds up to 1M byte that is expandable up to 4M bytes. The unit can accommodate up to 1,400M bytes of attachable

storage and support as many as 31 local and remote workstations.

Designed to increase productivity in the office, the Voso/ES enhances vendor-developed programs such as the Relational Data Base Facility, the Nihongo-Japanese-Text Composer 2 and the Business Graphics Feature.

Using 8-in. disk technology, the H-8591-2 fixed-disk storage unit can hold up to 130M bytes per spindle, has an average access time of 33.5 msec and a maximum storage capacity of 520M bytes.

The L-450's basic configuration, consisting of 5M bytes of main memory, a floppy disk drive, 70M bytes of disk storage, a workstation and serial printer, carries a monthly rental charge of 450,000 yen (approx-

imately \$190/mo). An L-470 system with 1M byte of main storage, a floppy disk drive, 260M bytes of disk storage, two workstations, a serial printer and a line printer can be rented monthly for 800,000 yen (approximately \$340/mo).

Further information is available from the vendor at 470 Madison Ave., New York, N.Y. 10027.

## Gould SEL Inks Pact With Geisco

ROLLING MEADOWS, Ill. — Gould SEL has signed a multimillion-dollar contract to supply computers and communications equipment to General Electric Information Services Co. (Geisco), front-ending one of the largest telecommunications networks in the world.

Keeping up with increasing user demands was the reason for the massive equipment upgrade, Geisco said. According to the vendor, the phasing in of Gould's Concept 32/27 CPUs will take up to 10 years, beginning this September. The computers will include a new communications model and a remote capability for unattended operation.

Gould SEL reportedly competed against Honeywell, Inc., Data General Corp., Digital Equipment Corp., IBM and Digital Communications Corp. for the long-term contract, which the company labeled "a major communications win."

## Disk Firms Back Three-In. Format

Fourteen manufacturers of floppy disk drives and storage media, including three U.S. and 11 Japanese firms, have joined Matsushita Electric Industrial Ltd., Hitachi Maxell Ltd. and Hitachi Ltd. in supporting standards for 3-in. compact floppy disk drives.

The 3-in. format was announced by the latter three companies a year ago and was submitted to the American National Standards Institute committee in September as well as to Japanese Industrial Standards committee in August.

The 14 companies include: Memorex Corp., Micro Peripherals, Inc., and Minnesota Mining & Manufacturing Co., all of the U.S., and Canon Electronics, Inc., Fuji Photo Film Co., Ltd., Itoh Electronics Co., Ltd., Matsushita Electric Co., Ltd., Nippon Seimitsu Kogyo Co., Ltd., Sanyo Electric Co., Ltd., TDK Electronics Co., Ltd., Teac Corp., Teijin Ltd. and Tokyo Electric Co., all of Japan.

In another standards matter, 22 disk drive and controller manufacturers have agreed to propose a new 5¼-in. Winchester disk drive interface standard to provide higher performance, faster transfer rate and higher storage capacities. The enhanced disk interface will be a modified version of an interface developed by Seagate Technology Corp. and will reportedly double the old standard data transfer rate of 5M bit/sec.

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As Computerworld expands its weekly news coverage of communications with interpretive information on products, equipment and services, Computerworld On Communications will complement that coverage with focused attention on the broader issues facing business communications users.

Computerworld On Communications will keep readers current on changing trends in the design, acquisition, operation, and optimization of corporate communications facilities. It will look at communications and networks from a systems perspective that relates technical capabilities with corporate goals.

In this ten issues for 1983, Computerworld On Communications will apply the proven editorial resources of Computerworld to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.



So, if you're among the majority of Computerworld subscribers who are personally involved in the selection and implementation of communications equipment and services for their organization, you'll find Computerworld On Communications a valuable addition to the Computerworld family of special publications.

As a Computerworld subscriber, you will automatically receive the ten 1983 issues of Computerworld On Communications as part of your subscription. If you're not already subscribing to Computerworld, call toll free 800-343-5730.

Remember to look for Computerworld On Communications on May 18th and again on September 28th (advertising deadlines April 8th and August 1983).

For advertising information on Computerworld On Communications, call Bill Dwyer, National Accounts Manager at (617) 879-0700 or your local Computerworld sales representative.

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## Forecasts & Findings

### Graphics Station Boom

The market for computer graphics workstations, spearheaded by a four-fold rise in the business graphics segment, will increase 175% over 1982 levels by 1986, accounting for nearly \$7 billion in sales, according to *The Computer Graphics Workstations Market in the U.S.*, by Frost & Sullivan, Inc.

The report predicted that revenues from hardware, software and related services will grow from \$2.5 billion in 1982 to \$6.9 billion in 1986, surpassing \$19 billion in 1990. The three principal applications areas are business graphics, computer-aided design and manufacture and process control.

The report is priced at \$1,275 from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

### Bell PBX Share to Drop

Interconnect companies will account for 48% of the \$10.1 billion worth of private branch exchanges (PBX) sold in 1990, beating out the Bell companies for the first time, according to *The PBX Market*, by Frost & Sullivan, Inc.

The Bell share that year is expected to fall to 42% from 48% in 1982, when the interconnects accounted for only 40% of the \$2.8 billion total, the study said. Pricing of PBX systems is expected to remain steady in real terms at the current \$800 to \$1,200 per line, a hardware manufacturing cost savings offset by higher support service costs.

Priced at \$1,275, the study is available from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

### Competition in Local Nets

Competitive advantage in the local-area network market will be predicated upon system performance, according to *Local Area Networks: A Strategic Analysis 1981-1990*, by Venture Development Corp.

Local nets will have to accommodate user requirements for vendors to remain competitive, the report stated. Industry shipments of 136,000 nodes are predicted in 1983, where a node refers to a cluster of peripherals such as eight terminals or eight microcomputers or one computer, with shipments to increase to 1,175,000 nodes in 1990.

The report is priced at \$2,490 from Venture Development at 1 Washington St., Wellesley, Mass. 02181.

### Vertical Markets Best Bet

As the microcomputer market becomes increasingly saturated with similar types of hardware, vendors who target vertical markets through applications software will have a decisive advantage in expanding their share of this competitive market-place, according to *Vertical Strategies for Microcomputer Hardware and Software* by Creative Strategies International, Inc.

According to the report, vast potential and expansive growth opportunities exist among nine key vertical markets analyzed. Representing as much as 25% of the small business market for microcomputers, hardware and software revenues in these vertical markets will increase from

\$500 million in 1982 to nearly \$1.5 billion in 1987, a compound annual growth of 25%.

Priced at \$1,450, the study is available from Creative Strategies, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

### DBMS Market to Boom

Independent software houses and hardware manufacturer suppliers of data base management systems (DBMS) will see annual market growth of 32% over the next five years, reaching sales of \$1.75 billion by 1987, according to *The DBMS Marketplace*, by International Data Corp.

The report predicted that, by 1987, traditional DBMS packages for main-

frames will account for 67% of the entire marketplace for these products. Programs for desktop computers will capture a 12% share, while hardware manufacturers can expect their DBMS revenues to grow at an increasing rate over the next several years.

Priced at \$2,500, the report is available from International Data Corp., 5 Speen St., Framingham, Mass. 01701.

### Bell's PBX Hold Slipping

AT&T will have difficulty holding onto its already declining share of the private-branch exchange (PBX) market during its reorganization, with the former Bell operating companies no longer captive markets and

American Bell, Inc., the unregulated subsidiary, not yet fully operational, according to *The PBX Industry: A Strategic Analysis*, by Venture Development Corp.

The report maintained that the AT&T market share for PBX shipments, which has already declined to 36% from previous levels of better than 75% only a few years ago, will decline still further to 24% in 1984. At the end of the five-year forecast period, the study predicted, AT&T will still be the largest single producer of PBXs, but will not attain its former dominance.

Priced at \$2,790, the report is available from Venture Development, 1 Washington St., Wellesley, Mass. 02181.

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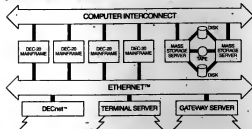
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digital

**National Semiconductor Corp.** and **OKI Electric Industry Co., Ltd.**, in conjunction with **OKI Semiconductor, Inc.**, have signed the second phase of a long-term joint development contract covering 64K-byte dynamic random-access memories (RAM) and other advanced MOS products. In a contract signed last fall, the companies agreed to a 64K-byte dynamic RAM technical and manufacturing exchange.

Under a \$4.5 million program sponsored by the

**U.S. Agency for International Development, Georgia Institute of Technology** is heading up a project to build a computerized network of information services for Egypt.

**Ramtek Corp.** has formed a marketing administration group to handle all administrative functions for the firm's realigned sales and marketing operations. Dan

**Burkhalter** has joined the firm in the newly created position of manager, marketing administration, and Linda Kroening has been appointed manager, corporate communications.

**GTE Information Services, Inc.** will provide on-line stock market quotations and other financial information through its financial information network, **Finet**, to

**ISFA Corp.**, Tampa, Fla., under a three-year, \$10 million contract.

**International Data Base Systems, Inc.**, manufacturer of the Seed data base management system, has changed its name to **Seed Software**.

**Pansophic Systems, Inc.** has acquired **Software Generation Technology Corp.**'s

software product, **SGT**, a query and reporting system designed for use with **IBM Corp.**'s **CICS**.

**Hazeltine Corp.** has reached agreement in principle with two employee management groups and other private investors on the sale of both its computer terminal and graphics display terminal product lines. **John Sasso**, vice-president of computer terminal equipment for Hazeltine, will be president of the new company purchasing the computer terminal line, and **Bruce Backe**, president of Hazeltine's **Imlac** subsidiary, will head up the new firm purchasing the graphics display terminal line.

**Nippon Electric Co., Ltd. (NEC)** of Tokyo, and **Standard Microsystems Corp. (SMC)** of Hauppauge, N.Y., have signed an agreement providing for the worldwide, nonexclusive cross-licensing of each company's patents and patent applications relating to semiconductors and the transfer of technology required for SMC's becoming a second source for a number of NEC's microprocessor and microcomputer-related (MOS) very large-scale integration circuit products.

**Prime Computer, Inc.** is offering a 50% allowance to four-year colleges and universities on systems sales and upgrades, including most central systems, peripherals, software and all manuals. A 20% discount is available to all other nonprofit educational institutions.

**IBM** has expanded the marketing of its **Personal Computer** to include value-added sales organizations. **IBM Entry Systems**, Boca Raton, Fla., and the **Distribution Channels** unit in Rye Brook, N.Y., will be authorizing selected regional and national organizations to market the computer.

**NCR Corp.** has established a component evaluation and test center in Wichita, Kan. The center will receive and test semiconductor devices for use by all of NCR's engineering and manufacturing operations.

## Supershorts

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We invite comparison on the basis of quality, reliability and performance... even though the competition may seem unfair since the Houston Instrument **C2MPLOT**® costs much less than the competition. The competitive edge of the CPS-19 is based on solid design and meaningful capabilities. The end result is a highly cost effective, 34.5" four-pen plotter that performs tirelessly and flawlessly on its owner's behalf. At its highly competitive price\*, the Houston Instrument CPS-19 full-size plotter is thousands of dollars more affordable than others of comparable performance.

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For the name, address and phone number of your nearest representative, write Houston Instrument, 8500 Cameron Road, Austin, Texas 78753. Phone 512-835-0900, or 1-800-531-5205 if outside Texas. In Europe contact Bausch & Lomb Belgium NV, Rochesterlaan 6, 8240 Gistel, Belgium. Tel 059-27-74-45. Tlx 846-81399.

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# POSITION ANNOUNCEMENTS

## SYSTEM PROGRAMMERS AUBURN UNIVERSITY

Our systems programming staff positions have been increased to provide additional operating system support required due to the addition of both computing and software resources.

Three systems programmer positions are available at Auburn University.

One position will share responsibility for the MVS/SP operating system, compilers, program products, and I/O system software.

One position will share responsibility for the communications software, which currently includes TCM 10, ACT/VTAM, and ACT/NOE.

One position will share responsibility for the VM/CMS operating system, its generation development, installation, and maintenance.

### Qualifications Desired:

Bachelors degree required. Masters degree preferred. Two or more years experience in systems programming or an equivalent combination of education and experience. Knowledge of MVS internals, installation, and maintenance, or knowledge of VM/CMS internals, installation, and maintenance. Must be able to communicate and write clearly and effectively.

Send a letter of application and a current resume to:

Terry Daugherty, Director  
Computer Center  
Division of University Computing  
144 Parker Hall  
Auburn University, AL 36849

Application deadline: April 1, 1983

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# Career Opportunities in the Southwest

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There's no other recreational or business environment quite like you'll find in the mountain states! Rapid industrial growth and development and business relocations have opened up new frontiers for computer professionals. Yet, the boom has not even begun to reach its peak. Virtually any type of computer environment or position is available right now.

As the world's largest recruiting firm that specializes exclusively in the computer profession, we represent *hundreds* of client organizations based in Arizona, Colorado, New Mexico and Utah. A small sampling of opportunities are listed below.

If you are interested in any position or others not printed here, simply call us. There's absolutely no cost to you, and, best of all, any expenses involved in interviewing and subsequent relocation (including costs of moving and temporary living arrangements) are assumed by our client organizations.

### Arizona

**Senior Analyst — Banking Applications.** Leading Arizona financial institution seeks a professional to assume full responsibility for project definition, planning, scheduling, resource management and final implementation. Excellent visibility to executive management. Position requires extensive banking knowledge, management skills and familiarity with large-scale IBM data base oriented systems. To \$33,000.

**Systems Analyst — System 38.** Growing restructuring firm in smaller Arizona community provides a great opportunity to build a staff and develop the data processing function. Proven leadership and technical skills including RPG II desired. Excellent opportunity. To \$28,000.

**Systems Analyst — New Corporate Subsidiary.** Recently formed subsidiary of a prestigious Fortune 500 corporation seeks an Analyst to assist in the development of its first data processing systems. Position provides exposure to the corporate state-of-the-art data center, yet offers the benefits of a small, well-organized company. Solid background in COBOL, structured design techniques and previous system design responsibilities. Phoenix location. To \$33,000.

**Minicomputer Systems Programmer.** Phoenix based firm seeks an individual with extensive DEC PDP/11 software background to assume complete responsibility for system integrity, performance, generation and maintenance. Knowledge of minicomputers in a distributed processing environment preferred. To \$34,000.

**Data Base Analyst — Low Cost of Living.** Growing organization in a stable industry seeks professionals to staff its newly created formal data base function. Two years experience with IMS, or other data base management system preferred. To \$37,000.

**Systems Engineer — Dual Career Path.** Computer hardware vendor who ranks among the leaders in Distributed Data Communications seeks an Analyst to join its Phoenix office staff. Knowledge of several high level languages, data communications concepts and minicomputers is desired. Position offers exceptional growth opportunities in either technical or marketing ranks. To \$38,000.

**Consultants — High Technology.** Small Phoenix firm is expanding its Consulting Group and seeks computing professionals with extensive MS, CICS, Series 1 experience and familiarity with a wide variety of large and small systems applications sought. To \$44,000.

**Micro Systems Programmer.** Prestigious computer hardware manufacturer seeks an experienced retail Programmer/Analyst to participate in the development of applications for small aerospace industries. Extensive Assembler and PASCAL engineering orientation and excellent oral/written communication skills required. Southern Arizona location. To \$36,000.

**Real-Time Programmer/Analyst — Graphics Software.** Growth-oriented service firm seeks a professional to join its consulting staff which provides software development for a wide variety of engineering firms. Position requires expertise in Assembler and PASCAL. Language and previous experience in graphics or automated drafting systems. Moderate travel provided. Phoenix location. To \$34,000.

**Senior MVS Systems Programmer.** Nationally known Phoenix organization offers challenging position with responsibility for MVS performance evaluation, hardware evaluation and planning. Extensive TP network design and training of junior staff members. Obvious technical background sought. Preference for those with strong leadership abilities and a desire for future management responsibilities. To \$40,000.

**Operations Analyst — Distributed Processing.** Phoenix area organization seeks a professional to analyze corporate operations to determine new operating center locations and develop techniques to enhance existing systems. Background should include business degree and operations management experience. To \$34,000.

**Engineering Analyst.** High technology New Mexico-based firm seeks an Engineering Programmer with strong background in CAD/CAM (I/IS, FORTRAN, minicomputers) and graphics. Degree in Engineering required. Requires light travel and extensive interface with non-CP personnel. To \$40,000.

**RPG II Programmer — Learn COBOL.** CICS. Northern Arizona organization seeks a professional with solid RPG programming skills to assist in financial and inventory development. Broad business applications exposure preferred. To \$25,000.

**Programmers — HP3000.** Major Arizona organization is beginning the implementation of HP 3000-based distributed information systems. It offers outstanding internal training opportunities in a recession-proof industry. To \$25,000, M.I. S.E. degrees to \$30,000.

**Minicomputer Specialists.** Communications firm has multiple projects for mini/micro Programmers and Software Engineers to develop state-of-the-art communications based systems on microcomputers as front-end vehicles to handle line traffic and support multipurpose communications networks. To \$28,000, B.S. degree to \$35,000.

**Systems Analyst — Web Development.** Finestrel, Inc. Web division of a Fortune 500 corporation seeks an experienced Analyst with at least three years financial systems, strong project control techniques and communication skills required. Proven minicomputer experience. To \$34,000.

**ALC Programmer/Analyst.** Corporate Data Communications Group of a Phoenix-based Fortune 500 company seeks an individual to participate in the development of sophisticated remote teleprocessing systems using VTAM, CICS, IMS/DC and IBM 3031 under MVS. Company offers extensive formal training in both technical and personal development areas. To \$33,000.

**MSB Director.** Fast-growing diversified Phoenix company in the financial field seeks an individual to manage all data processing functions. Position reports directly to the CEO. To \$50,000 plus bonus and profit sharing.

**IMS Programmer/Analysts.** Requires two years COBOL, IMS experience. Three new 1983 projects. To \$27,000, B.S. degree to \$31,000.

**MRP Project Leader.** Major Phoenix manufacturer requires expertise in MRP implementation. Four year project. Management growth. To \$42,000.

**IMS Project Leader.** New MSDC development projects (one manufacturing, one financial). Used 7-10 staff. Unique opportunity. To \$33,000.

**Programmer/Analyst — On-Line System Development.** Growing Phoenix manufacturer seeks a professional to assist in the development and installation of a totally on-line manufacturing and financial control system. Communications systems provided. COBOL, IMS, and knowledge of MVS systems required. To \$33,000.

**Systems Manager — On-Line Development.** Suburban Phoenix organization offers an exceptional opportunity for a professional with previous project management experience to direct the development of new on-line financial systems. Strong project control techniques and communication skills required. Proven minicomputer experience. To \$34,000.

### New Mexico

**Scientific Programmer.** New Mexico mining firm seeks aggressive, technically-oriented individual with expertise in mathematical analysis and financial simulations. B.S. degree, DEC, VAX and FORTRAN experience sought. To \$30,000, M.S. degree to \$35,000.

**Junior Programmer/Analyst.** Progressive New Mexico hospital offers an exceptional opportunity in the development of patient care and administrative systems. Will consider as little as six months experience. Prefer exposure to both COBOL and Assembler language. To \$23,000.

**Systems Programmer.** Leading New Mexico firm has created a new position requiring expertise in standards development, hardware software evaluation and systems tuning. 370/CVS/VSE/VM. Excellent benefits. To \$32,000.

**Resident Systems Engineer — MIPS.** Leading minicomputer firm with major client in Albuquerque area seeks a Systems Engineer with strong Assembler and data communications language experience on main systems. To \$35,000.

**Systems Programmer — CICS, VTAM.** Major firm with large-scale mainframes offers a key position for a highly technical person having solid experience in CICS and VTAM (OS/VS) mainframes. Albuquerque suburban location. To \$32,000.

**CICS Programmer/Analyst.** New development in 1983 requires three new staff members. COBOL and one year CICS experience helpful. To \$26,000.

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**Branch Manager - Services.** Leading computer service firm has requirement for a sales manager with a successful track record in tactical sales. Openings due to promotion. Package to \$80,000.

**Programmer/Analyst - COBOL/IMS/CICS.** International financial organization in midst of expansion seeks two years OS/COBOL experience plus CICS or IMS. Training provided in either CICS or IMS. Knowledge of structural techniques helpful. To \$28,000.

**Business FORTRAN Programmers.** Few divisions of major transportation company with new data center seeks individuals with three years FORTRAN programming experience with business applications. Multiple openings. Project Manager will be selected in near future from the programming staff. To \$28,000.

**Mini/Programmer - Interactive Applications.** International diversified corporation seeks a professional with three years experience in FORTRAN, RISCAL, or PL/I to work in interactive and graphics software development. Projects involve development of technical training and educational systems. To \$30,000.

**COBOL Programmer - Small Colorado Town.** Stable manufacturing firm in low-cost-of-living area seeks IBM COBOL Programmer for on-line applications development. Excellent year-round climate, access to mountains. To \$27,000.

**BASIC Programmer.** Minimum one year experience as Programmer/Analyst in BASIC, preferably in small or medium scale hardware environment, qualifies you for a position in a growing manufacturing organization. Unique chance to move into a Senior Programmer position with systems responsibility. To \$25,000.

**COBOL Programmer - Burroughs.** Exciting opportunity for a professional with three years COBOL experience. Situation in a Burroughs medium systems environment and involves the development of new financial systems in a Colorado growth industry. To \$31,000.

**Systems Analyst - Banking.** New electronic banking department of a large Denver bank is automating various manual systems and seeks a professional with bank operations knowledge and programming background to work with user departments. To \$30,000.

**Senior Programmer/Analyst - Medical Technology.** High tech manufacturer of medical equipment seeks four year COBOL Programmer/Analyst with project management potential. Suburban Denver location. On-line Data Base applications. To \$38,000.

**Programmer/Analyst - Formal Training.** International computer hardware manufacturer has multiple openings for Programmer/Analysts with a minimum of two years COBOL, on IBM, OS or DEC environments. This Fortune 500 company has an excellent internal training program. To \$35,000.

**DDA Programmer/Analyst.** Major Denver bank in the process of re-selling new banking packages seeks an individual with two years OS/COBOL background and DDA knowledge. Will modify existing programs or develop new DDA system. To \$28,000.

**Junior Consultant.** National consulting firm seeks a degreed professional having a broad background in programming and analysis for its Denver staff. Advancement to Senior Consultant within two years. To \$27,000.

**Systems Manager.** New Denver firm seeks a Manager preferably with some or all of the following: strong knowledge of commercial applications, project management, real-time data processing, and COBOL exposure. To \$35,000.

**Customer Applications Analyst - Time-sharing.** Highly-respected national computer services firm with well-established Colorado customer base seeks marketing professionals having at least one year experience in any DP sales activity. Anticipated first year compensation to \$40,000.

**Sales Representatives - Time-sharing.** Highly-respected national computer services firm with well-established Colorado customer base seeks marketing professionals having at least one year experience in any DP sales activity. Anticipated first year compensation to \$40,000.

**Minicomputer Software Programmer - New Development.** Two years Minicomputer Assembler qualifies you for a chance to be a part of a team involved in the development of operating systems and compilers. This Denver company is developing an advanced state-of-the-art super computer for scientific and engineering applications. To \$30,000.

**FORTRAN Programmer - Energy.** Major oil company seeks minimum of two years FORTRAN programming experience. Oil and gas applications and IBM/DEC experience helpful. Excellent career growth potential. To \$32,000.

**Sales.** International services firm seeks a seasoned data processing sales executive with a strong technical background and sales management experience. Position involves management of sales staff in Denver. To \$45,000.

**Programmer/Analyst - International Travel.** Software consulting firm with an international client base seeks a motivated, professional programmer with two years COBOL experience. Some travel provided as member of a support team. Denver location. To \$35,000.

**Programmer/Analyst - New IMS Development.** Headquarters of a major division of an international firm moving into a new Denver data center seeks a professional with two years OS/COBOL experience. Knowledge of IMS preferred. Will be assigned to exclusive new systems development projects. To \$29,000.

**Programmer/Analysts - Manufacturing.** Multiple positions exist for Programmers having a minimum of two years COBOL or PL/I experience for its expanding Denver suburban data center. Manufacturing applications experience and familiarity with RPG I highly desired. To \$30,000.

**Real-Time Programmer/Analyst.** National software development consulting firm in beautiful Colorado Springs seeks a professional with solid FORTRAN experience combined with any hardware real-time applications programming exposure, preferably on CDC. To \$32,000.

### Utah

**COBOL Programmer/Analyst - International Firm.** Prestigious corporation with a worldwide customer base seeks an experienced COBOL Programmer/Analyst. VAX or manufacturing experience is desirable. To \$30,000.

**RPG II Programmer/Analyst.** High tech company based in Salt Lake seeks an experienced RPG II, IV/2000 Programmer to assist with a conversion of manufacturing applications to an IV/2000. To \$28,000.

**Programmer/Analyst - IMS.** International financial firm with new data center in Salt Lake seeks a professional with two years OS/COBOL plus IMS DB/DC. Offers full relocation package. Ground floor opportunity. To \$35,000.

**Software Engineer.** Highly-respected, local firm located south of Salt Lake City seeks individuals experienced in complex development or maintenance to become members of their compiler optimization staff. To \$44,000.

**CICS Systems Programmer.** Stable and established Salt Lake organization is in need of a Systems Programmer to install and maintain CICS on Ampex mainframe. To \$32,000.

**Data Base Analyst - VAX.** New position for this high technology manufacturing firm. Two years COBOL, on VAX utilizing DBMS under VMS sought. To \$30,000.

**EDP Auditor.** Division of national oil company seeks EDP audit experience for position requiring international travel. French or Spanish fluency highly preferred. To \$40,000.

**Real-Time Programmer/Analysts.** International, billion dollar firm plans to expand its local Utah workforce over the next year. It seeks professionals having FORTRAN programming experience and real-time applications. To \$30,000.

**Systems Programmers.** Fast growing division of an international company located in Salt Lake City seeks individuals with at least two years of large-scale IBM/IMS systems programming experience. On-line or data base experience preferred. To \$34,000.

**Senior Engineering Analyst.** Leading firm in real-time process control and material handling systems seeks a degreed professional with one-to-six years of software experience in control systems or IBM Series-1 or aerospace background and move to private industry. Salt Lake City location. To \$34,000.

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Candidates for this position should possess a Bachelor's degree (or equivalent) with at least six years of job related experience in systems design and project leadership, preferably in a manufacturing environment. Some experience in a supervisory or managerial position is also required. Qualifications would include the top positions in MIS processing in a smaller company or a manager/supervisor in a larger company.

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|-----------------------------------------|----------|
| Mgr. ATM - Statewide Network            | \$35-40  |
| Sr. Systems Analyst - Hingham Mgmt.     | \$25-30K |
| Programmer/Analyst On-Line CICS/ATM/MVS | \$28-30K |
| Programmer/Analyst Bank Data            | \$24-27K |
| Programmer/Analyst COBOL/VS             | \$18-22K |

### INSURANCE

|                                          |          |
|------------------------------------------|----------|
| Systems Analyst 5/7 yrs. large scale IBM | \$26-34K |
| Analyst - MVS/VS CICS/VS                 | \$25-30K |
| Programmer/Analyst 3/5 yrs. COBOL OS-MVS | \$20-28K |

### DCS

### MANUFACTURING

|                                            |          |
|--------------------------------------------|----------|
| Senior Analyst OS/MVS COBOL - Mfg. apps.   | \$29-34K |
| Programmer/Analyst OS/MVS MVS - Mfg. apps. | \$25-32K |

### TECH. SUPPORT

|                                   |          |
|-----------------------------------|----------|
| Systems Programmer AS/400-3-DASD  | \$30-36K |
| Systems Programmer CICS/VS-3-DASD | \$30-36K |
| Systems Programmer - VM GURU      | \$30-36K |

These positions reflect a portion of the active openings that I am recruiting for. Locally, and STATEWIDE I am also recruiting for similar openings in the Southwest. Client companies include a host of... including interviewing and relocation costs. Initiations are "State of the Art" and offer defined career path progression. Forward your resume and/or call for appointment.

### BILL DENNEY

### VICE PRESIDENT

JIM VICK AND ASSOCIATES

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Jacksonville, FL 32207

904-388-7371

## EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer training and support

Call or send resume in rough order of preference, listing location preferences, education and experience including computer models, operating systems and languages in which you are or were trained. Our client companies are at our best. We guide you through.

|                                                                                                                                    |                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>RESP SERVICES Dept C</b><br>Suite 100, One Cherry Hill Mall<br>P.O. Box 5813<br>Cherry Hill, New Jersey 08034<br>(609) 681-6400 | <b>RESP SERVICES Dept C</b><br>Suite 211, Dulles Hall<br>1777 Norton Road<br>Burien, Pennsylvania 19002<br>(215) 863-0043 |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|

### RESP SERVICES

Employment Agents for Computer Professionals



## EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

### BOSTON

#### IMS TECH SUPPORT

Progressive bus software development seeks techs with exp. to develop new audit software releases. Must have strong BSL, good + any DBMS exp. Outstanding career challenge. **\$33,000**

#### BANKING/BAL/COROL

Progressive & dynamic company seeks techs with exp. to develop new audit software releases. Must have strong BSL, good + any DBMS exp. Outstanding career challenge. **\$33,000**

#### CIC TECH SUPPORT

Well-known consumer goods mfr seeks tech with exp. to develop new audit software releases. Must have strong BSL, good + any DBMS exp. Outstanding career challenge. **\$33,000**

#### CHALLENGING JOB W/INT

Challenging job w/int. Must have strong BSL, good + any DBMS exp. Outstanding career challenge. **\$33,000**

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### HARTFORD

#### SYSTEMS PROG'S

CT clients seeking MVS or DL/I software and Bus. Comp. offering fast track exp. to fast track, promising mfr's. **\$50,000+**

#### DATA BASE

MIS DBS/DB design & tech consulting field position for corp staff pos leading to DB admin. resp. Res 34 yrs and **\$35,000**

#### HONEYWELL

CT clients for a Data Base sys prog & multi-user Honeywell site-of-the-art client. Min 3 yrs exp. for qualification for **\$35,000**

#### TELECOM'S

Min 3 yrs network software exp. w/ACR/VITAM MCP, CICS networks. Focus of network performance debugging facilities desired for CT accts. **\$40,000**

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### SOUTHERN CALIFORNIA

#### LOS ANGELES

#### SYSTEMS PROGRAMMER

Client firms have immediate needs for experienced Systems Programmer/Discreetives include MIS, IMS or CICS. Don't wait call or send resume today! **\$30 to \$50,000**

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Los Angeles, Inc. 3600 Wilshire, #2000 Los Angeles, CA 90010 (213) 388-8805

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#### EDP AUDITORS

Immediate need for auditors with a Data Processing background. Large scale IBM exp. desirable. **\$34,000**

#### ROBERT HALF

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### DALLAS

#### FT. LAUDERDALE

#### IMS SPECIALIST

Multi-million dollar public corporation based in Ft. Lauderdale is seeking a Data Base analyst with strong foundation in IMS/DC, 11. Individual will design, develop and control of computer data bases. Fantastic fringe pay by the company, including interesting relocation package. Step up to this industry leader for challenge in an IBM state-of-the-art environment and rapid upward mobility. Salary in **\$33,000**

#### ROBERT HALF

of Fort Lauderdale 7770 W. Oakland Pl. Blvd. Suite 610 Ft. Lauderdale, FL 33301 (305) 747-0020

#### DATA BASE MANAGER

Large diversified consulting seeks individual with exp. in IBM, IMS, COROL, ALC background. Must have min 2 yrs exp. in DBA. Excellent benefits. Degree required. **\$40,000**

#### COMMUNICATIONS

#### SYSTEMS PROGRAMMER

Must be prominent to write computer code in North Dakota. Seeking position to install, maintain & support computer systems. Must have min 2 yrs exp. in IMS/DC, Prof. Adv. VITAM, MCP, TCM exp. **\$38,000**

#### ROBERT HALF

of Dallas 2700 North East, #750 Dallas, TX 75201 (214) 953-3300

#### DAYTON

#### EDP AUDITORS

"State-of-the-art" shop. Major mfr seeks growth oriented pos with MIS DB/COBOL exp. to develop new systems. Excellent position. Fee Paid. **\$32-\$30,000**

#### ROBERT HALF

of Dayton 5000 North Main, #200 Dayton, OH 45424 (513) 234-0800

#### ST. LOUIS

#### EDP AUDITOR

Fortune 500 consumer product firm seeks an experienced data processing mgr looking for a full-time position to management. Requires good communication skills, excellent analytical skills and experience with large scale IBM equipment. BS in Act or preferred. Salary to **\$55,000**

#### PROJECT MANAGER

Previous national accounting firm seeks an experienced Project Manager with a heavy technical background. Must have min 5 yrs exp. in IBM equipment. BS in Act or preferred. Salary to **\$55,000**

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#### SEATTLE

#### DATA BASE ANALYST

Progressive Seattle headquarters of national corporation seeks analyst with 7-10 yrs DP experience, including 4+ yrs experience with DB/11 in an IBM OS data base shop. Substantial data base design experience. Salary DOE

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Responsibilities include supervision and coordination of present programming staff of eight. This is a new position due to the rapid growth of this department. Ideal candidate should possess demonstrated interpersonal skills, a background in programming and testing standards along with the ability to act as a liaison between programming, systems and DP operations.

#### COBOL PROGRAMMERS

Due to increased business needs, individuals are required who possess a minimum of two years experience in writing COBOL programs for business applications.

**STROEDMANN BROTHERS COMPANY** offers competitive starting salaries, a comprehensive benefits package which includes a 401(k) retirement plan, along with career growth opportunities. Interested applicants should forward resume, along with salary requirements to:

D.T. ROUSCHKE, MANAGER, INFORMATION SERVICES  
STROEDMANN BROTHERS COMPANY  
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Williamsport, PA 17071

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### DATA PROCESSING POSITIONS THE NATIONAL FINANCE CENTER U.S. DEPARTMENT OF AGRICULTURE

Located at Michoud in East New Orleans has permanent Data Processing positions available in the following areas: computer systems analysis and programming; data base support; systems software; ADP security and standards. Salary commensurate with experience. Forty hour work week with flexible hours. Full Civil Service benefits and job security. Applicants must meet qualification requirements as published by the Office of Personnel Management.

Applications from employees with current U.S. Civil Service status are welcome.

Applications may be obtained by contacting:

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Personnel Office  
P.O. Box 98,000  
New Orleans, LA 70180  
(504) 255-8564

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### DATA PROCESSING

We are a Chicago based company with two data processing divisions and an extensive sales and marketing department. We are seeking highly motivated individuals with a minimum of two years experience in data processing and systems support under pressure.

#### PROGRAMMER ANALYST

3-5 years experience in COBOL, C, C++, and CICS knowledge of RPG II and DB/2. Must have a minimum of two years experience in data processing and systems support.

#### ANALYST

Minimum knowledge of COBOL, CICS, and DB/2. Must have a minimum of two years experience in data processing and systems support.

In return we offer a competitive salary and a comprehensive benefits package. Please send your resume and salary requirements to:

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### ENHANCED PROFESSIONALISM IN INFORMATION/COMPUTER SCIENCE

Overseas International College (OIC) of the University of California, Irvine, is currently seeking individuals to provide leadership in a program in information systems and computer science. Applicants should have a Ph.D. in a computer related field and a minimum of five years experience in computer science, a strong commitment to research, and a strong commitment to teaching.

Interested individuals should send a letter of interest and curriculum vitae to:

Dr. W. A. Rouse, Professor, School of Information Systems, Overseas International College, P.O. Box 16000, Irvine, CA 92716.

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## SOFTWARE PROFESSIONALS

**TANO CORPORATION** is committed to bringing creativity and ingenuity to its products which include the industry's most sophisticated matrix and industrial supervisory control, energy management and data acquisition systems. Our continued expansion offers new opportunities to Software Professionals.

**SUPERVISORS SOFTWARE SYSTEMS** - hold direct line responsibility for project staff and products. Candidates must possess relevant degree and have five years real-time or systems software experience.

**LEAD PROGRAMMERS** - provide technical and administrative leadership to software projects. Candidates must possess relevant degree and three years experience with one of the following: real-time software, Motorola 680X, RSX11-M, or VAX, process control, or energy management.

**DESIGN PROGRAMMERS** - design, test and/or engineer software products and create support systems. Candidates must possess relevant degree and three years experience with one of the following: real-time software, Motorola 680X, RSX11-M, or VAX, process control, or energy management.

**USER SERVICE/APPLICATION SUPPORT MGR** - responsible for all aspects of user support including analysis, scheduling and reporting, software maintenance and documentation, quality control and personnel management. Candidates must possess degree in computer science or have equivalent experience, plus minimum 2 years business application support/development experience.

**DESIGN PROGRAMMERS/OPERATIONS** - prepare system design and software specifications for new systems. Candidates must possess computer related degree, minimum 1 year experience with RSTS/E or VAX/VMS operating systems and BASIC &/or BASIC II or VMS, VAX BASIC.

**TANO CORPORATION** offers an excellent compensation and benefit package, including 100% company paid medical insurance, normative plan and pension trust. Please telephone to present qualifications or submit resume, in confidence, to:

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Personnel Recruitment Department

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- Data Processing supervisory experience required
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Experience with IBM 370 or IBM 3033 with OS/VSJCL and 4331 DOS/VSE preferred. RPG programming experience a plus. Manufacturing and financial application experience also preferred.

Kimberly-Clark can offer the individual selected a competitive salary and a comprehensive benefits package. Qualified individuals should send a letter or resume in confidence before March 18, 1983 to: Personnel Manager, Kimberly-Clark Corporation, Beach Island, South Carolina 29841. An Equal Opportunity Employer M/F/H.

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needed for day and evening courses. Experience in COBOL, BAL, BASIC, Fortran, systems analysis, programming techniques, MATH, C, C++, PASCAL, PL/I, computer graphics, and data base management sought. BA/BS required.  
Additional Information:  
Assistant Director,  
Special Programs,  
210 725-7172.  
Send resume and letter indicating courses for which you are competent:  
Director of Special Programs,  
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17 Lexington Avenue,  
Box 400-A, NYC 10010.

**Baruch College**

The City University of New York  
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## EDP

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TAL I, P/10 ..... \$20PM  
PROJ Mgr/Analyst sys AD M/MS ..... \$47M  
SOFTWARE MGR SYS VSI/DCS ..... \$43M  
PROJ MGR SYS VSI/DCS ..... \$43M  
VAX 11/780 AD/Analyst Software Support  
Sys. Lane Resources ..... \$43M  
VAX Smith Chip Analyst ..... \$43M  
QCS Chief Of P/MS sys major new  
major sys DMS ..... \$43M  
SYS ADM Mgr 25 security monitor sys ..... \$43M  
SYS ADM Mgr 25 security monitor sys ..... \$43M  
TANDEM Proj Mgr T/MS, TAL anal  
processing sys dev ..... \$39M  
SYS ADM Mgr 25 sys ..... \$39M  
QCS EMR Proj ADM sys major sys ..... \$39M  
C/25 Sys ADM Data Base Dev ..... \$37M  
SYS PROJ Mgr NECP Support ..... \$36M  
QCS Sys ADM Data Base Dev ..... \$36M  
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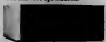
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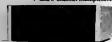
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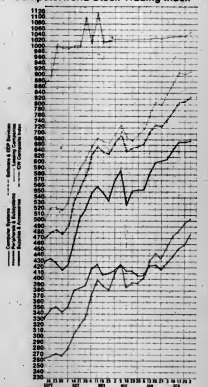


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|------------------|----------------------|---------|--------|-------|------|--------|-----------------------|---------|--------|-------|------|--------|-------------------------|---------|--------|-------|------|
|                  |                      | 1981-82 | CLOS   | NEW   | CHG  |        |                       | 1981-82 | CLOS   | NEW   | CHG  |        |                         | 1981-82 | CLOS   | NEW   | CHG  |
| RANGE            | CHG                  | RANGE   | CHG    | RANGE | CHG  | RANGE  | CHG                   | RANGE   | CHG    | RANGE | CHG  | RANGE  | CHG                     | RANGE   | CHG    |       |      |
| 11               | 1982                 | 11      | 1982   | 11    | 1982 | 11     | 1982                  | 11      | 1982   | 11    | 1982 | 11     | 1982                    | 11      | 1982   |       |      |
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| 3                | ABRACON, CORP.       | 17-44   | 40 7/8 | + 7/8 | +2-1 | 8      | ADVANCED CORP. TECH.  | 1-4     | 2 1/2  | - 1/4 | -2-8 | 1      | ACOMPUTER CONSUMER      | 18-44   | 39     | - 1/2 | +5-1 |
| 3                | ABRACON, CORP.       | 39-48   | 47 3/8 | + 1/8 | +1-3 | 9      | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 2      | ACOMPUTER SERVICES INC. | 41-41   | 13 3/8 | + 1/8 | +1-8 |
| 3                | ACOMPUTER AUTOMATION | 7-17    | 18 1/8 | + 1/2 | +2-1 | 10     | ADVANCED SYSTEMS INC. | 22      | 16 3/8 | + 1/2 | +2-8 | 3      | ADAMCO INC.             | 18-49   | 42 3/8 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 11     | ADVANCED SYSTEMS INC. | 8-22    | 21 3/4 | + 1/2 | +2-8 | 4      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 12     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 5      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 13     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 6      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 14     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 7      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 15     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 8      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 16     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 9      | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 17     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 10     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 18     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 11     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 19     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 12     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 20     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 13     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 21     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 14     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 22     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 15     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 23     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 16     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 24     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 17     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 25     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 18     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 26     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 19     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 27     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 20     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 28     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 21     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 29     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 22     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 30     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 23     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 31     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 24     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 32     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 25     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 33     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 26     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 34     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 27     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 35     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 28     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 36     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 29     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 37     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 30     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 38     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 31     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 39     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 32     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 40     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 33     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 41     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 34     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 42     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 35     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 43     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 36     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 44     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 37     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 45     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 38     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 46     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 39     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 47     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 40     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 48     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 41     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 49     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 42     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 50     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 43     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 51     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 44     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 52     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 45     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 53     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 46     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 54     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 47     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 55     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 48     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 56     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 49     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 57     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 50     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 58     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 51     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 59     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 52     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 60     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 53     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 61     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 54     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 62     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 55     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 63     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 56     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 64     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 57     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 65     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 58     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 66     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 59     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 67     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 60     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 68     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 61     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 69     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 62     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 70     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 63     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 71     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 64     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 72     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 65     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 73     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 66     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 74     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 67     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 75     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 68     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 76     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 69     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 77     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 70     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 78     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 71     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 79     | ADVANCED SYSTEMS INC. | 8-24    | 12 3/4 | - 1/4 | -2-8 | 72     | ADAMCO INC.             | 21-50   | 32 1/4 | - 1/4 | -1-1 |
| 3                | ADAMCO INC.          | 39-48   | 44 3/4 | + 3/8 | +1-1 | 80     | ADV                   |         |        |       |      |        |                         |         |        |       |      |

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| Atlanta, GA<br>April 11         | Minneapolis, MN<br>March 22    |
| Baltimore, MD<br>April 25       | New Orleans, LA<br>April 25    |
| Beechwood, OH<br>February 22    | New York, NY<br>March 25       |
| Cambridge, MA<br>March 22       | Norfolk, VA<br>March 1         |
| Charlotte, NC<br>March 17       | Oak Brook, IL<br>April 26      |
| Chicago, IL<br>March 2          | Oklahoma City, OK<br>March 24  |
| Cincinnati, OH<br>April 19      | Omaha, NE<br>March 29          |
| Columbia, SC<br>April 26        | Phoenix, AZ<br>February 28     |
| Dallas, TX<br>March 4           | Pittsburgh, PA<br>April 7      |
| Dearborn, MI<br>March 10        | Portland, OR<br>April 14       |
| Denver, CO<br>April 27          | Rochester, NY<br>April 12      |
| Des Moines, IA<br>March 20      | St. Louis, MO<br>March 4       |
| Dublin, OH<br>March 3           | Salt Lake City, UT<br>April 20 |
| Grand Rapids, MI<br>April 23    | San Antonio, TX<br>March 2     |
| Houston, TX<br>April 7          | San Diego, CA<br>May 4         |
| Indianapolis, IN<br>March 22    | San Francisco, CA<br>April 27  |
| Kansas City, MO<br>March 15     | San Jose, CA<br>April 26       |
| King of Prussia, PA<br>March 16 | San Pedro, CA<br>April 12      |
| Little Rock, AR<br>April 12     | Seattle, WA<br>April 14        |
| Los Angeles, CA<br>April 15     | Secaucus, NJ<br>March 9        |
| Louisville, KY<br>March 3       | Tampa, FL<br>April 19          |
| Madison, WI<br>April 16         | University City, CA<br>May 2   |
| Memphis, TN<br>March 22         |                                |

### Canadian Conferences

- |                                        |                                        |
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